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Computer Weekly

Thursday, March 12, 1981

Govt shortlist for purchase of micros

by Rory Johnston

A SHORTLIST of nine companies has been drawn up by the Central Computers and Telecommunications Agency for all purchases of microcomputers, for use in government departments from now on. Of the nine, only three manufacture their machines in Britain.

The shortlist is intended to promote standardisation and save the effort involved in sifting through tenders from the 250 firms currently supplying microcomputers.

Departments will be free to make their choice from three suppliers in each of three groups, covering machines in the price ranges up to £2,500, up to £6,000, and over £6,000. "Departments would have to have a jolly good case" to buy from a firm outside the nine, said Gerald Watson, head of CCTA.

In the first group the firms are: Research Machines, Microsense, and Commodore; in the second Casio Electronics, Modata and Thame; and in the third BMG, Equinox, and Wilkes Computing. Of these, Research Machines, Casio and BMG actually make their machines in the UK; the rest import from the US.

Contracts will have been taken out with these firms giving the government substantial discounts and laying down delivery and maintenance arrangements. No quantities are specified; the government agency has the right to buy on these terms when it chooses.

All the machines on the list support Micro Cobol, from



Amdahl . . . "Acsys now has practically enough money."

CII-HB sinks \$10m in Gene Amdahl's fledgling company

by Keith Jones

GENE Amdahl has raised an estimated \$10 million worth of capital for his new firm, Acsys, from CII-Honeywell Bull, giving the French-based mainframe supplier a significant minority share in the recently established manufacturer of large-scale IBM compatible processors.

Gene Amdahl told Computer Weekly that he was not actively pursuing any other sources of funds in Europe and he did not wish to enlarge on abortive talks with the Japanese company, Mitsubishi, about funding for Acsys. He said that Acsys now had "practically enough money".

Under the deal between Acsys and CII-HB, the latter has acquired the rights to the VLSI logic circuitry being developed by Acsys

and Honeywell Information Systems will also be able to use it. But a Honeywell Information Systems spokesman in Minneapolis said that it was highly unlikely that the deal would lead to HIS selling Acsys processors when they became available.

CII-HB spokesman in Paris also stressed that his company had no intention of selling Acsys machines in Europe or of developing its own family of IBM compatible processors.

Acsys and CII-HB agreed not to divulge either the amount of money involved in the deal or the percentage share taken in Acsys by CII-HB. But the CII-HB spokesman said that reports putting the figure at \$10 million were not far off the mark. He said that CII-HB planned to incorporate the Acsys semiconductor technology

in its next generation of machines. A link-up between Acsys and Mitsubishi would have pointed to some extent the relationship between Amdahl Corp, which set up by Gene Amdahl about two years ago, and Fujitsu.

Mitsubishi's plans to develop

a family of IBM compatible machines and its work on 5000 gate ECL chips were discussed in Computer Weekly on December 1. But the computer side of Mitsubishi is far smaller than Fujitsu and there are no plans to bring in IBM compatible machines with power rating above eight mips.

IBM watcher Bob Ferla of Advanced Computer Techniques in New York, commented on the prospects for the proposed Acsys machine: "They're talking about 1985. That's too late to be competitive with H series architecture."

benefit, has been shut completely. Apart from disruption to the work of the Department of Employment and of the DHSS, the industrial action will also severely delay the planned conversion from ICL 1906A to ICL 2982 equipment, scheduled to take place next month.

The main significance of the strike by staff at the two Inland Revenue centres at Shipley, West Yorkshire and Cumbernauld, near Glasgow, is that cheques arriving at these centres will not be banked, so aggravating the squeeze on cash flow that has been affected since Friday.

One small victory for the government is that the VAT installation at Southend has not been shut down. According to a spokesman for the Customs and Excise, "The fight has seen some industrial action, but the net effect is that the computer is still working."

British Telecom's finance director told Computer Weekly that the temporary furlough last week when Sir Keith announced a £145 million extension to its budget until the end of the financial year (this month) was a satisfactory formula and will be worked out to provide large-scale funding for modernisation and expansion without price increases.

Other recommendations included freedom to offer more added services and to choose maintenance contractors for PABXs.

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The normal procedure is that these organisations pay on the 19th of each month. As a result, the reaction of large organisations to the Inland Revenue's letter this week will play a large part in determining the success or failure of the action.

by Nicholas Enticknap

THE Council of Civil Service Unions is claiming complete success for its first week of industrial action, designed to hit the government in the administration of vital day-to-day business.

Computer systems used for processing National Insurance payments and for certain Naval administrative procedures have been shut down from last Monday, and installations used for processing income tax records have been affected since Friday.

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Scope itself, now owned by London-based Officegate which is in turn owned by the American Ira Gale, Radius Computer Services of Hull, and Compton Business Machines of Kingston-upon-Thames.

Officegate bought Scope from the receiver after the Sheffield company's principal banker, Williams & Glyn, had recalled a £200,000 debenture and put it into receivership with the loss of 70 jobs at the end of February. The price paid was £25,000 for the assets and goodwill of Scope. But this deal pipped an offer from Radius which had thought it was to take over Scope after offering, it says, £15,000.

Gale, who says he was in on the bidding at an early stage, is now

trying to keep the market held by Scope. Though he has acquired the company's assets, the maintenance agreements on Flexowriters and Computepers held by Scope lapsed on its liquidation, according to receivers Peat, Marwick, Mitchell. These agreements actually appeared on Scope's books as debts, since they were paid for in year in advance, and a substantial amount is outstanding on agreements which have still some time to run.

Both Gale and Radius have ap-

roached the manufacturer of the

● Turn to back page

Shopping with magnetic card in France

by Jack Gee

FRANCE'S Crédit Agricole, the biggest banking group in the world, has announced it is embarking on the first nationwide network in France of point of sale terminals in shops and other retail outlets.

Crédit Agricole intends to install 30,000 online terminals over the next five years. The £16 million contract could go to any of 70 manufacturers of terminals in France, Germany and Belgium who have been invited to present tenders. The French bank has not approached British makers.

Crédit Agricole's ambitious venture follows a pilot experiment which it has been conducting since July 1980 with the Euromarché firm's hypermarket in Limoges, where NCR equipment was tested.

The payment operation is based on a magnetic card which the shopper presents at the cash desk, where it is fed into the point of sale terminal. The bank's central computer at once flashes a series of figures on the terminal's display screen to indicate whether the shopper's account is in credit.

The shopper then taps out his own code number — not his account number — on a pin pad which resembles a pocket calculator and is shielded so that not even the cashier can read the secret figures.

The terminal produces a



A customer pays at the Euromarché hypermarket in Limoges, site of the pilot project for Crédit Agricole's national network of online PoS terminals at retail outlets.

voucher giving the amount paid, the number of the customer's account and date. This serves as a record of the operation for both the shop and customer. The central computer can debit the shopper's account and credit the stores in real time. But customers are allowed the same delays for transfers of funds as with a cheque.

Jean-Paul Granday, data processing manager for Crédit Agricole in the Limoges area, says: "This type of banking operation is easier, faster and less prone to error."

Euromarché staff at the 24 cash desks quickly got used to the system. Average payment time was under 30 seconds, compared with over three times as long for cash and five times more for writing out a cheque (and each cheque costs 50p to process).

According to a recent study by France's Centre for Economic Research on Savings 85% of people who have used the magnetic shopping system approve and want to see it extended.

Before seeking NCR's co-operation for its Limoges experiment, Crédit Agricole examined the merits of an offline card with its own microprocessor memory which could be loaded with cash and then gradually discharged at each point of sale.

Other magnetic card trials are being conducted by banks at

Ecully, near Lyon, and around Bourg-en-Bresse, a poultry producing area midway between Lyon and Geneva where the Banque Régionale de l'Ain, a private banking firm, launched its experiment early in 1979.

IBM, the French firm Innovatron has been pushing its offline card.

But a project to launch the Innovatron card in association with French banking members of the Visa-affiliated Blue Card system fell through when the State-owned Honeywell Bull, Schlumberger and Philips.

A small-scale test of offline cards has already begun in Lyon and others are scheduled for middle-sized French towns later this year.

Crédit Agricole, sponsoring the most ambitious point of sale terminal project launched to date, is waiting for other banks to follow its example. Assistant general manager Bruno de Maulde told a convention on payment methods held at Monte Carlo: "It can only operate."

Rivaling the online cards which Crédit Agricole and Banque Régionale de l'Ain have developed in partnership with NCR and

ten banks has set up a non-profit making trade group with the French PTT to study offline cards and is now awaiting tenders from Honeywell Bull, Schlumberger and Philips.

Innovation has sold a 23% stake in its capital to the Franco-US firm Schlumberger. Schlumberger has gone into partnership with CII-Honeywell Bull and Siemens to press ahead with this project.

The Banque de France, the French State bank, is looking closely at both offline and online systems and has set up a special committee for this task. A group of

employees has been formed by bank shareholders.

The terminal produces a

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NCR aims at wages by cash dispenser

by Paul Fisher

A CLAIM that up to £619,000 has been paid in "royalties" to Swiss and British companies or individuals by Infotech, was made at a contentious creditors' meeting in London last week.

The conference and training company, which has been bought by Robert Maxwell's Pergamon Press for £135,000, is in liquidation with debts of £974,298.

Accountant Richard Floyd of Floyd, Nash & Co, who said that his firm had not previously acted for either Infotech or Pergamon prior to being called in by the Infotech board on February 4, attributed the crash to four factors: the economic recession; royalties and commissions paid; the activities of MTS UK Holdings Ltd. So far the only cheques traced back to individuals which have been discovered by Mason show two payments totalling £9,000 requested by Goodman and Wilkins and made payable to Pitman.

The main problem is that the majority of employees from the US paid in cash rather than their bank account is far higher than most other industrial countries, compared with 5% in Germany, 2% in France and 1% in the US. It costs about £1 service a year's cash payment according to NCR.

The 1780 on four floors will operate in office mode, being used to dispense whole or part payments of up to £100. It is open to the public and to individuals which have been discovered by MTS.

The royalty payments were calculated against turnover and took no account of profitability or bad debts. Until 1980 the royalty was between 7% and 10% of turnover after which it was reduced to 2.7% of turnover.

Floyd said: "We feel that thorough investigation should be made about funds transferred abroad."

Floyd drew attention to the contribution that he claimed MTS had made to Infotech's losses. MTS was owned by former Infotech director and current shareholder, John Blake.

Floyd said that MTS had received between £51,000 and £63,000 and he claimed that MTS had "scheduled many more courses than was feasible."

The fourth reason for the destabilisation caused by what Floyd called "internal pressures". Some directors have attributed the upsets to the return of founder Roy Goodman, from the US in 1979 after the closure of Infotech International Inc.

A reflection of the dissent amongst Infotech management is apparent in the fact that two liquidators have been appointed to wind up Infotech's affairs. Sitting between Floyd and Mason at the creditors' meeting was Solomon Cohen, the accountant from Pitman and Cohen who worked on Infotech's two previous liquidations in 1970 and 1975. Cohen's appointment was in accordance with the wishes of Goodman and Wilkins and had the support of Blake.

Cohen was formerly in partnership with John Pitman, one of the Infotech UK Holding shareholders.

On February 25, the same day as the shareholders' meeting which saw the joint liquidator agreement, came the offer for purchase from Robert Maxwell. The offer was open for acceptance within 12 hours. Mason said that there had been negotiations with 11 bidders which were whittled down to four.

The Pergamon price is twice the value of Infotech's tangible assets.

Former Infotech lecturer, Mike Kerford Byrnes, made an indignant speech about the "lecturers" erosion

of trust in the company and wondered why a claim for a mere £17,000 from CMS, a subsidiary of Pergamon Infotech.

There are 528 trade and expenses creditors of the liquidated company. Twelve are owed in excess of £10,000, including the Post Office which is owed over £26,000. There are 505 creditors whose total amounts to £30,444.

The creditors' meeting concluded with the acceptance of Pergamon's proposal: the Post Office, CMS, the Inland Revenue, a company called Vlasak and, representing some of the smaller creditors, Chris Balderton.

'£619,000 in royalties'—Infotech creditors probe



Glimpsed former Infotech directors at the creditors' meeting last week (from left): Keith Robinson and John Guy (directors), Chris Boon (managing director) and Clive Wilkins (chairman).

tech affairs. Both Boon and Robinson are on the board of Pergamon Infotech.

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Another ex-lecturer challenged the directors of Programmer Training to stand up. Keith Robinson, ex-Infotech director, and Chris Boon, ex-Infotech managing director and shareholder, said they were involved, explaining they had formed the company in 1980, when Goodman had started reassuring himself in Info-

US disc manufacturer to sell Scots factory

by Keith Jones

A FLOPPY disc drive manufacturing operation with plants at Livingston in Scotland and in the US is up for sale at a price of about \$2.5 million following a decision by the US-based MPE Corp to concentrate on its magnetic tape and instrumentation products.

According to MPE this move is being made despite a heavy order book and results from the big investment that would have been needed to stay in the floppy disc drive business.

Bill Lahti, managing director of MPE Ltd, said that the parent company might be prepared to sell off the Livingston factory separately from the floppy disc drive manufacturing operation in the US, which is located at the firm's headquarters at Salem, New Hampshire. The Livingston plant was set up in 1978 to exploit the European floppy disc drive market.

MPE is to continue accepting orders for floppy disc drives for another two months, and to ship for another six months.

According to Lahti it would take another year for the Livingston

factory to become completely independent.

He quoted a price of \$1.5 million for the Livingston operation, including receivables, and said there was no time limit for offers. But he pointed out that the staff at Livingston, nearly 50, would be made redundant on April 17 if no sale was made before then.

The MPE drives are all 8-inch units, including double-sided, double-density models, and Lahti said that about 30,000 drives had been shipped worldwide since MPE started building them about four years ago. But a \$6 million investment would have been needed in capital equipment and parts to stay in the business, and this money could not be found with MPE's \$24 million turnover and the amount of research and development needed to keep abreast of present developments.

A technique for speeding up processing of bank cheques at store checkouts has been adopted by the RNLI hypermarket in Beauvais in France. Its NCR 82 PoS terminals are fitted with a third print unit which automatically fills in the payee, date and amount on a blank cheque provided by the customer, who signs it.

The vouchers will be eliminated and the customer's copy replaced by the Army and Navy's own standard sales slip which will identify the credit card company. Each day the Army and Navy will also re-

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Net/One to be used in Case local network

by Donald Kennett

CASE is to use Net/One from Ungermann-Bass in the US as the local networking element of its recently announced Casenet networking scheme.

A three-year agreement, under which the Rickmansworth data communications company expects to buy at least £200,000 worth of network modules a year from Ungermann-Bass, was announced last week at a seminar designed to introduce Casenet to some of the company's main customers.

CASE sales director Mike Haferty said he expected the first trial systems to be installed this autumn, probably in the City of London, and further modules of Casenet would be announced next year.

Ungermann-Bass vice-president Charlie Bass said he thought that future networks would implement the ISO open-networking model, although few did currently. Ethernet, on which Net/One was based, did not conform to the model because it was designed before the model was developed. But Net/One did the job of the first four levels and CASE would add the functions of the higher levels.

The other, based on non-content or guaranteed delivery, was less well-developed but was likely to have some effect in broadband networking where data was transmitted on a modulated carrier frequency and shared a cable with, for example, television distribution.

The American National Standards Institute and the International Standards Organisation were likely to say something dra-



BASS . . . "standards are not much in evidence in local networking."

matic on local networking in the next year, but had not played their hand yet, Bass said.

Ethernet has its limitations, Bass conceded, and for that reason his company planned to provide alternatives at the lower levels in future. Its strategy had been to

separate the transmission medium from the equipment implementing the access technique, so as to allow changes within the life of the product. One office with a baseband network and another with a broadband network should present identical characteristics to their users.

Shelton launches Sig/net

by Donald Kennett

HAVING designed the Nascom 1 and 2 personal computers under contract, London-based design consultancy, Shelton Instruments has launched a system called Sig/net under its own name aimed at both the industrial control and small business system markets.

The first five basic modules will

be available from the beginning of next month, either separately or packaged as a desk-top business system running CP/M, with a 4MHz Z80 processor, 64K bytes of RAM, two 5½-inch single-sided double-density Tandon floppy disc drives and two V24 serial ports, priced at £1,299.

Tory MP calls for more robots

by Chris Youett

A MIDLAND MP is pressing the government to help industry make more use of robots. Iain Mills (Tory, Meriden) said: "The running success of the Mini Metro has shown that Britain must grasp the opportunity of using advanced automation to improve both qual-

ity and productivity. The need for government help in developing robots and in installing them is considerable."

Mills asked the Information Technology Minister, Kenneth Baker, in the Commons, what action the government was taking. Baker said his department pro-

vided support for research, use and manufacture of robots. Government support was now running at about £1.5 million a year.

"In addition, the Science Research Council looks ahead to the next generation of robots with its industrial partnerships programme," Baker said.

Micro is designed for word processing

by Eileen Stalder

A Z80-BASED microcomputer, built around the S100 bus is available from Scottish computer company Alairco. Called the Mikro 1000, it is specifically designed to simplify word processing and has a starting price of £3,500.

Mikro 1000 runs the standard CPM 2.2 operating system which also controls the software designed keys on the keyboard. Over 40 keys have been programmed to match the command structure of the Wordstar word processing package.

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Prudent move

MOHAWK Data Sciences made savings of about \$3 million through lower interest rates in January after a stock offering made to reduce bank debt, says chairman Ralph O'Brien. "We added a slowing of our order rate in our European subsidiaries during the summer and through October," US computer and communications systems company Mohawk has reported \$5 million profits for the third quarter, bringing the nine-month total to \$13.4 million.

TRAFFORD HOUSE
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Inmos aims to win most of fast 16K static RAM market

by Frank Ogden

AFTER last month's INSCC presentation in New York, Inmos has started to look like the formidable VLSI house which it promised all along to be.

With the provisional specification for the Inmos 64K dynamic RAM showing a real touch of class, the company now states that it can deliver its high performance but expensive 16K static part with two micron scaled HMOS currently being run on conventional projection printers. Inmos claim that, while performance boosting of its process has only just begun, Intel is more or less at the end of the line.

John Heighley, Inmos' managing director, claims that both Intel and Texas Instruments have recognised that step and repeat processing is the right way to go, and these two companies are rushing to build new front end wafer fabrication plants based on this technology.

Heighley is also looking for a lead in the 64K dynamic RAM market based on technical excellence rather than price. His company is to market the 64K x 1 IMS2600, with volume delivery scheduled for the end of this year on the basis of a new architecture.

Rankin, based at the Inmos Cheyenne Mountain, Colorado Springs headquarters, estimated that the "fast" 16K static memory market was currently worth about \$35 million and that his own company aimed to capture nearly all of it.

"Inmos is currently sampling more than 50 customers with the 16K IMS1400," he said.

As yet the only other company

to threaten seriously Inmos' chances in this particular segment of the memory market is Intel with its 2167 16K static RAM. It says

that it can deliver volume quantities of the 55 nanosecond device within 12 weeks of ordering but at a price more than \$30 below Inmos.

Inmos is quick to point on the step and repeat processing used on the IMS1400 should enable better yields and better development prospects than Intel's expensive 16K static part with 45 nanoseconds access time. Also there is a promise that device scaling from the relatively conservative 2.7 micron features will produce good parts running at 35 nanoseconds maximum access time. This would take the Inmos 16K static device into the speed range of current RCL (emitter-coupled-logic) technology, but without the power penalty.

With the introduction of the IMS1400-45, the company has dropped the price on its standard 55 nanosecond part from \$165 to \$103 in 100-off quantities. According to marketing director Douglas Rankin a further iteration of the basic 16K static design will lead to a 4K x 8-bit word organised memory appearing by the third quarter of this year.

Rankin, based at the Inmos Cheyenne Mountain, Colorado Springs headquarters, estimated that the "fast" 16K static memory market was currently worth about \$35 million and that his own company aimed to capture nearly all of it.

By ingenious design wrinkles the basic 100 nanosecond part can be made to look like a 16K x 1 memory with a high speed serial output. Memory contents in the four array quadrants can be re-arranged successively simply by toggling the CAS line up to 25MHz. Thus two banks of IMS2600 devices can maintain continuous interleaved data stream of 25 Mbit/sec, an equivalent access time of 40 nanoseconds.

THE UK's pre-eminence in world software could be seriously undermined by competition from India within five years, MPs were told at the latest meeting of the Parliamentary Information Technology Committee.

Speakers from the floor, mainly representatives of UK software houses, pointed out that India possessed most of the advantages that Britain had in this field, such as high literacy rates, plenty of graduates, and the use of English.

Some companies, such as Leeds mini-maker Systime, already have programming operations in India.

The Parliamentary Information

Technology Committee was

discussing government software procurement, with speakers from the software industry, the unions, and the Civil Service.

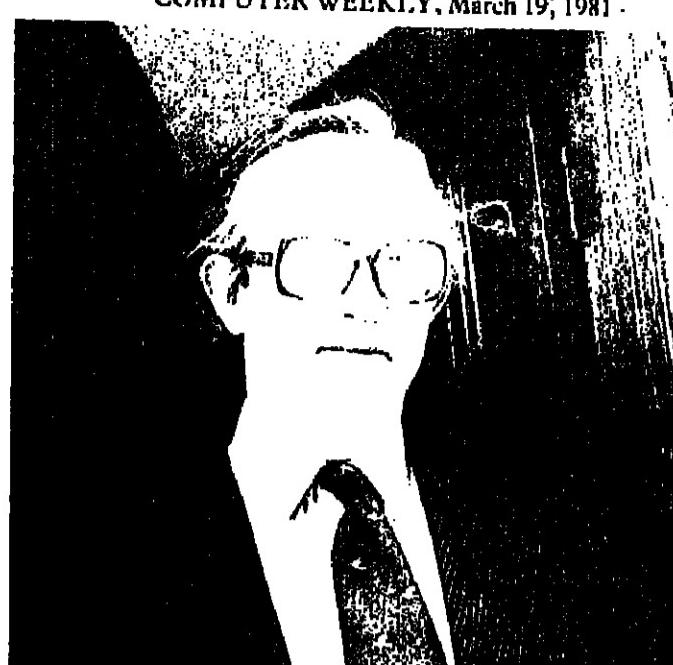
All that had to happen, it was suggested, was for the Indian government to clear away the bureaucracy that was currently

holding back developments, particularly problems with accessing networks and online databases overseas. The Indian PTT's efficiency is low, and this needs to be rectified.

Roy Grantham, general secretary of the white collar union Apex, stressed the importance of software and the need for training, but avoided the vital issue of the attitude of the civil servants' unions to software houses. This delicate question of whether outside contractors should be used in place of Civil Service programmers was skirted around at the meeting.

The UK could have future as an offshore software house for Japan, some people thought, but then Japan would start producing its own software and all Britain would be left with was the job of writing manuals.

GIBBENS . . . Software houses should become prime contractors.



GIBBENS . . . Software houses should become prime contractors.

Indian threat to the UK's lead in software expertise

by Keith Jones

IN theory up to 12 megabytes of floppy disc storage can be interfaced with an Apple microcomputer using the 8000 series disc subsystem developed by Eicon Research of Cambridge. In practice Eicon plans to promote a two-megabyte version which is considered big enough for running the database packages now available for Apple users.

The Apple could support up to three of the Eicon controllers, bringing the capacity up to a maximum of 12 megabytes, although in practice the user would probably find it cheaper to go over to an 8-inch hard disc.

Apple dealer Eicon is sufficiently confident about the reception of its 8000 system among other Apple dealers and Apple users, that it has placed a £200,000 OEM order with Teleprinter Equipment of Tring for double-sided, double density floppy disc drives built in the US by Decitek of Westboro, Massachusetts. Teleprinter is the Decitek distributor in the UK.

Up to four of the one-megabyte Decitek drives can be supported

by the 8000 series controller which was developed by Eicon itself. The two-megabyte version will cost £1,780 to end users. An extra £1300 is charged to bring the capacity up to four megabytes.

The Apple could support up to three of the Eicon controllers, bringing the capacity up to a maximum of 12 megabytes, although in practice the user would probably find it cheaper to go over to an 8-inch hard disc.

Later this year Eicon plans to bring out a version of the 8000 series compatible with the S100 bus on Intel and Zilog-based microcomputers.

Eicon managing director John Hartley said that Decitek floppy disc drives had been selected by Eicon in favour of other makes because of the quietness and accuracy derived from using a linear motor rather than a stepper motor to move the read/write head.

The secret's in the thimble. It

has 128 characters, instead of the more usual 96. You get 36% more flexibility in handling paperwork than with most of the daisy-wheel and golf-ball print elements of other printers. In English, French, German, Scandinavian, name it. And one thimble will last more than 30 million clear impressions. Quietly, quickly.

That's just for openers.

Also, system modularity means your Series 5500 printer will grow as your requirements grow. And one of the nice things about it all is that it really won't cost you a thing to

switch. 7 Interface capabilities, including

those for Diablo, QUME and Centronics, means the NEC Spinwriter Series 5500, which comes in three models, gives you camera-ready print quality. You can plot,

graph, superscript, subscript. Tab horizontally or vertically. And print bidirectionally.

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200 screens will link to joint WP and DP system

by Rory Johnston

A COMBINED word and data processing system complete with its own local area networking system has been launched by Omnidata, the California firm that has designed products for Triumph Adler and is now branching out on its own.

A xerographic printer from U-Bix in Japan is expected to be available as an optional extra by the end of the year.

Up to 200 screens can be attached to Omnidata's 1.5-megabit local network that uses IBM, SDLC protocols to provide access to shared printers and discs worldwide.

The Omni 2 consists of separate screen, keyboard and twin floppy disc units which can nestle together on a desk. Mathematical and sorting functions are provided when in word processor mode, and data processing can be done either in Cobol or Basic. Including a Qume daisy-wheel printer, one Omni 2 sells for £6,250.

The U-Bix printer will also act as a copier and will sell for between £10,000 and £15,000.

Surveying the Omni 2 assembly line in Westlake, California, are two of the firm's founders, Paul van Alstyne and George Greenspon, who have switched from designing word processors for other people to working for themselves.



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This is a Direct Plus Compatible Alternative to the DEC DZ11B option.

DZ11B and is also available as a DZ11A or DZ11B option.

Information retrieval and point-to-point communication are likely to be the fastest-growing applications of data communications in Europe during the 1980s. While point-to-point is unlikely to take off until the 1990s, because such a high degree of co-operation and co-ordination is required between banks and other users.

This is reported by Robert Jackson, a member of the Logistics team which carried out the Eurodata 79 study for the European PTTs. His paper on user applications was one of 11 presented by the study team at a seminar organized by Comshare.

Information retrieval was identified as being of major impon-

Dealers attack CAP

by Kevin Cahill
 MAJOR criticisms of UK software giant CAP were voiced at a meeting of Sord dealers.

The meeting, in Beaconsfield, was attended by 14 dealers from over the UK, and the Penzance-based Sord distributor, Exleight Business Systems.

Dealers at the meeting, called to launch the Sord master batch package and to demonstrate the PIPS data handling software, complained about having to buy demonstration software from CAP, unfriendly prompts and difficult manuals.

Don Martin, a director of Exleight Business Systems, described the meeting as stormy, he felt, however, that he had been able to calm some of the dealers' fears by pointing out that extensive research in the UK and abroad had failed to produce a better set of packages than CAP's.

A spokesman for CAP said they were sorry to hear of the criticism and hoped that the new CAP structure would make support to the dealers easier and better.

Both products are said to be fully compatible with the Commodore interpreter, so that existing programs can be re-compiled to run 10 to 20 times faster. It also converts integers to real numbers

SOFTWARE FILE

Basic aim to beat the program pirates

TWO Basic products for use on the Commodore Pet have been released by a Dorset-based company to try and combat not only Basic's limitations in speed and performance, but also the illicit copying of programs written in the language.

DTL-Basic is the name of Drive Technology's compiler, which is said to reduce the run-times usually associated with the use of an interpreter, and also, since compiled programs are more compact, use less of the precious 32Kbytes of RAM on the Pet.

While DTL-Basic is aimed at hobbyists and educational users who do not intend to sell programs, a more sophisticated version of the same product is available for those concerned with protecting their software development, called DTL-P-Basic.

Both products are said to be fully compatible with the Commodore interpreter, so that existing programs can be re-compiled to run 10 to 20 times faster. It also converts integers to real numbers

being copied as well as individual files.

Although Hughes acknowledges the universal truth that any protection system written can be busted, he reckons that his is more fool-proof than most, since it has several layers to penetrate.

Versions of the compiler have been developed for the 3000 range of Commodore machines and the 4000/8000 range. Prices for the 3000 range, which should be available in April, are £300 for computer and manual, with £100 for annual update service for DTL-Basic.

For the protected version, DTL-P-Basic, manual and compiler cost £900, with the update service at £200 and a box of 10 protected discs for £180. But for the author who plans to sell his work commercially, Hughes suggests that the compiler will pay for itself quickly, as well as offering advantages in allowing more space for generously commented programs and therefore better documentation and maintenance.



ON the assumption that engineers need friendly computers, the Royal Aeronautical Society's Engineering Sciences Data Unit has produced two "user friendly" graphics packages aimed at cutting out much repetitive and time-consuming calculation in design areas such as structural engineering, material fatigue and fluid mechanics. The packages, called COMIPACs, allow engineers and see immediate results on the screen, using Tektronix 4051 graphics computers, as pictured here.

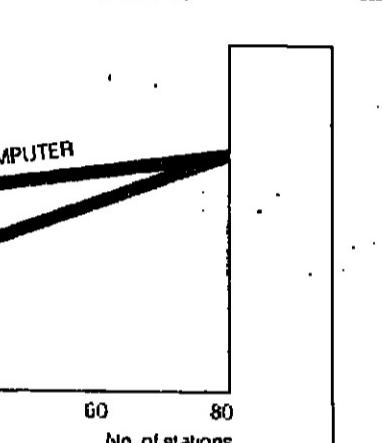
Package designed for first-time user

EXLEIGHT Business Systems has announced two new packages to run on the Sord range of microcomputers which Exleight distributes in the UK.

PIPS is a text and file handling package which is said to allow the

first-time user to create, sort, juggle, and analyse data without programming knowledge. The second package, as yet unnamed, is a specially tailored general accounts package for the Master Bakers Association.

IN last week's report on the Gower software protection conference reference was made to a software package called Lockheed. This is marketed by Software Products Inc, not by Sensible Software as we reported, known as Back-it-up.



ADP subsidiary to specialise in hotel computers

by Keith Jones

SEEING great potential in the hotel business for computer systems sales, ADP Network Services has set up a separate subsidiary company, ADP Hotel Services, to concentrate entirely on a market estimated to be worth about £100 million a year.

The main offering from ADP Hotel Services is a system based on the Rain Black Box multi-screen microcomputer. It comes with software development by ADP for handling jobs like local reservations, room management, food and beverage stock control, function booking, personnel records, and accounting operations such as ledger updating and profit and loss reports.

Hotel groups will be able to use their Black Box terminals to link into the ADP network for accounts control and central reservation processing, and all users will dump files on to the network for back-up.

The concept of a local system operating in conjunction with its network facilities is not new to ADP. For several years the company has been promoting its On-site service where most of the workload of a big customer is run on a dedicated Digital Equipment DECSYSTEM 2020 while ADP's DECSYSTEM 10-based worldwide network service remains available.

ADP's batch and network services are already used by 500 hotels in the UK and the US.

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Information retrieval was identified as being of major impon-



Roy Atherton teaches Comal on a Piccolo microcomputer.

Comal easier to learn for beginners'

by Nicholas Benwell

FOR this reason ADP has seen fit to use a play on words, ADP innately, to describe its new hotel service. It was developed entirely in the UK but, ADP expect to promote it in overseas markets.

ADP says that it selected the UK Black Box microcomputer for reasons like its multi-terminal configuration — there are at least two screens on each machine — the availability of a five-megabyte hard disc drive, easy access to the original supplier and the popular CP/M operating system which provides the possibility of software portability if an alternative machine model is ever needed.

To strengthen its credibility in the hotel business ADP has hired Alan Coby as ADP Hotel Services managing director. He has 12 years' experience in the hotel industry where he has developed systems for applications like management information, financial accounting and reporting. Coby referred to a survey carried out early last year in conjunction with the British Association of Hotel Accountants which revealed that nearly 90% of the 60 hotel groups reviewed used some form of computer system but felt that there was a need for suppliers to specialize in hotel applications.

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and it was easier to debug.

Pascal, perhaps Comal's nearest relative, was too difficult for the under 16s, and yet Comal programs, on average, are half the length of equivalent Pascal versions, insists Atherton.

Comal is currently implemented on only two or three microcomputers, so the field is wide open for the computer industry to adopt this new language. The style of implementation, though, is important as it is mainly diskette-based at the moment with the result that something of a juggling act is needed to set up a system.

Comal was said to be easier for beginners to learn than Basic because it tackles problems like number doubling in a way which relates more closely to a human approach. The resulting programs were likely to be shorter than when written in a computing language

Zynar, perhaps Comal's nearest relative, was too difficult for the under 16s, and yet Comal programs, on average, are half the length of equivalent Pascal versions, insists Atherton.

The Zynar/Nester network qualifies as the most cost-effective configuration possible today.

Its user-orientation and adaptability have secured an installation base covering such diverse activities as banking, transport, retailing and office automation.

When a system with this specification can pack as much power as a mini-computer for a fraction of the cost — that's news. That's Zynar.

Local network accommodates user workstations and system resources based on the popular Apple personal computer.

Typically 10-80 nodes per network.

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Zynar is the European business partner of Neistar Systems Inc.

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Zynar
 SILICON TECHNOLOGY & COMPUTER SCIENCE

COMPUTER WEEKLY, March 19, 1981

by Claire Gooding

Ada's place in 'Tower of Babel'

DR KNUT RIPKEN, who leads the team developing the front-end Ada computer, is to present a seminar on Ada, designed to inform marketing and software professionals of the latest developments in the language.

The seminar is to be held in London on April 23/24, sponsored by the Education Foundation of the US Data Processing Management Association and the UK IDPM. It is to focus on Ada's place in the programmer's "Tower of Babel", its main features and programming environment, as well as specific areas of writing and designing for the language.

Those interested in attending should contact H. Flournoy at State of the Art Ltd, on 01-2405.

Rory Johnston meets John Imlay, chairman of a remarkable software company that is charting a new course

OP 01/03/81 11:11
COMPUTER WEEKLY, March 19, 1981

MSA aims to be a major force in office of the future

THE announcement that US software products house Management Science America was going public, has focused attention on a firm with a colourful history and on its even more colourful chairman, John Imlay.

Based on the unspectacular field of financial and accounting packages, the company has turned, under Imlay's leadership, from a long and tortuous bankruptcy in the early Seventies to a turnover today of \$50 million, and is aiming to become a major force in the office of the future.

Up to now MSA has stuck fairly closely to its original product line of applications packages for financial reporting, ledgers, and payroll. Customers are offered standard options to fit their systems to the varying laws of different states, and are spared the considerable expense of program maintenance by the updates issued by MSA whenever, for instance, tax laws change.

There's no difference between what we are doing and developing a record for a record player.

Developments in communications are especially significant for Imlay's office of the future thinking. With satellites and cheap earth stations providing almost unlimited bandwidth, electronic mail and teleconferencing will become easily available and convenient, and so must be a central part of the system design. Teleconferencing, incidentally, is something Imlay is already enthusiastically using at MSA to link the offices that are scattered around the country.

"It provides lots of empathy," he says. Looking at MSA's traditional product line, Imlay says, "Business prospects are stronger than ever." The recession is causing some difficulty in getting orders actually signed, but on the whole, financial stringencies lead to more demand for his money-saving pro-

"Somebody has to tie the systems together," he says, adding that it will not be the companies already in the field. "They all have a hardware mentality," he asserts.

To this end, part of the proceeds of the sale of 1½ million shares will go towards acquiring small companies to provide MSA with

expertise it does not already have. Out of this is intended to come a system design for the office of the future that the customer will be able to run on whatever hardware he wants. "I don't care about the hardware as long as it has the capabilities needed," Imlay says.

Here he is flying in the face of all the opinion that says that office systems running on general purpose rather than specially designed hardware tend to be difficult to use and unsuited to the office environment and office workers.

He asserts adamantly, "There's no difference between what we are doing and developing a record for a record player."

Firms such as Exxon, Imlay says, are going to be selling a hardware product even though they claim to be selling a system.

In contrast, he suggests, "the fellow who designs a system without hardware will be giving the real value added," and this he intends to do, to run on practically anyone's kit.

He adds with a smile, "I want to be nice to Exxon."

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A UK office has been opened, and expansion is also under way into Australia, Canada, and Belgium.

UK financial reporting and ledger requirements are similar to those in the US, so MSA's software for those areas can be used here without much change, but payroll systems are totally different. For that reason MSA bought QPAC and its existing products, giving Imlay a complete range here.

He does not see himself as competing against UK software houses, but rather with their US equivalents and multinationals such as IBM and RTZ.

The fellow who designs a system without the hardware will be giving the real value added.

heel at the moment, Imlay says, "But in two years they will realise they need software and then . . ."

With government loans and tax concessions, and their traditional high productivity, the Japanese will be a major competitor by 1985



IMLAY... "I don't care about the hardware as long as it has the capabilities needed."

dacts, not less, Imlay believes. "The market is expanding faster than we can," he says.

The introduction of the IBM 4300 range has given MSA 200,000 new prospects, Imlay estimates, and with current penetration of the market less than 5%, the company is aiming to grow to 15,000 customers in the not too distant future.

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WORK

on the upper levels of the ISO layered networking architecture will involve a good deal of thrashing about for some time to come, according to Charlie Bass, co-founder of US local networking company Ungermann-Bass.

In his keynote speech at the Microsystems 81 conference last week, Bass told delegates that bringing together the methods used in many different applications and by many different system users were like religions; users were born with an approach and would live and die with it. It probably reflected their outlook and that of the organisation for which they worked.

However, it was increasingly recognised that the upper level functions - application, presentation and session control - could be worked out independently of the lower level ones and could remain consistent across different types of lower levels.

"Local networks concentrate on the lower levels," he said. "Ethernet only talks about levels

two and three and chips to do Ethernet will only encompass the lower levels. Our product encompasses the lower four levels and allows the user to get on with five, six and seven."

Bass outlined the alternatives available in local networking, since he thought that no one set of technological approaches would solve the world's problems. Topologies, he felt, were like religions; users were born with an approach and would live and die with it. It probably reflected their outlook and that of the organisation for which they worked.

X25 was being used in local networks simply because the parties wishing to communicate locally had already implemented it for long-haul communication.

Baseband systems, such as Ethernet, had been criticised for being unable to carry video traffic, but they saved on expensive broadband modems, since they put digital signals directly on to the cable. The lack of a modem gave rise to a trade-off between speed and range - 1,500 feet at 10Mbps or 4,000 feet at 4Mbps, as against up to 25 miles for broadband.

The UK was the centre of the universe for rings, he added, while

the bus was preferred by his organisation for its lack of central controller and its use of passive taps.

He predicted that in the 1980s local networking would converge with long-haul networking into something called integrated processing, where an individual at a terminal could access local or remote facilities with no apparent difference.

X25 was being used in local networks simply because the parties wishing to communicate locally had already implemented it for long-haul communication.

He drew attention to the differences between broadband and baseband transmission. Broadband, in which transmitted data was modulated on to a high frequency carrier, was very attractive to implementers of systems in which video, voice and data traffic were to be handled separately but

on the same cable.

Coaxial cable was used extensively in the cable television industry and it provided a bandwidth of up to 300MHz, capable of carrying about 150Mbps of data. Broadband techniques were ripe for leadership towards open networking standards, but the many companies active in the field, including Wang and IBM, were probably more interested in market leadership than standards leadership, he thought.

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Power supply maker Gresham Lion of Feltham, Middlesex, has diversified into terminals following a deal with James Scott Electronic Developments for the manufacturing and marketing rights to the Lynx 5000 132-column 6809-based VDU.

IN an effort to boost its systems sales, micro-maker Zilog used Microsystems 81 as the platform to launch a turnkey package based on its established MCZ-1 microcomputer, but now offered with an accounting package which runs under a Commercial Basic with a built-in operating system, as well as a printer and a VDU.

Zilog already accounts for 30% of Zilog's \$50 million (last year) worldwide sales, and in Europe the proportion is 60%, but these have always been sold to firms which were primarily customers for components. Systems division's head of European marketing Dr Pamela Geisler said last week it was a bit of a mystery how so many systems had been sold with awareness of Zilog as a systems company was so low.

The success of the rescue gave Zilog a chance to look outside at broader issues, and for 1979 he was president of ADAPSO, the US computing services association, the first to come from a software products house.

The issues of software copyright and unfair competition from the banks and accountants preoccupied him there. His efforts on copyright are finally coming to fruition, with a Bill currently before the House of Representatives, and a lawsuit still going on against Citicorp.

Asked what he is especially proud of from his time at ADAPSO, Imlay replies, "We opened up a dialogue with IBM." This included negotiations on software protection and the release of specifications of new products. The latter was largely successful, Imlay feels, and he also managed to get IBM to break up software packages so that the separate parts were small enough for his members to compete against.

Eventually he was reinstated at the insistence of creditors, he repaid all the major secured debts, and since 1972 the firm's turnover has grown from \$2.7 million to \$50 million without getting out of control.

The success of the rescue gave Zilog a chance to look outside at broader issues, and for 1979 he was president of ADAPSO, the US computing services association, the first to come from a software products house.

The aim was now to sign up dealers with expertise in the small business systems market, to complement the dealers whose expertise was rooted in industrial and component products.

Similar moves are being made by Zilog in the US, but there it is using Cobol programs instead of Basic.

The turnkey system with an Adaptec 9502 matrix printer costs £4,330 and with an NBC Spinwriter pen plotter £5,335. The Wordstar word processing software from Micropro is an option and versions run either under RIO or under CP/M.

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No connection

On March 5, Micro News reported on a high resolution graphics package for the Apple II, which is available from Systematics Ltd, 3 Hillberry Court, Bushey, Herts. The company has no connection with Systematics Ltd, which is part of the Systematics International Group, and is based in Bedfordshire, Essex.

Additional hardware for the system includes a video driver board containing up to 16K bytes of RAM and capable of controlling an eight-colour graphics display with a resolution of 240 by 240 pixels.

The board has also been im-

proved

so it is now compatible with the US ANSI standard. It has 16

bit

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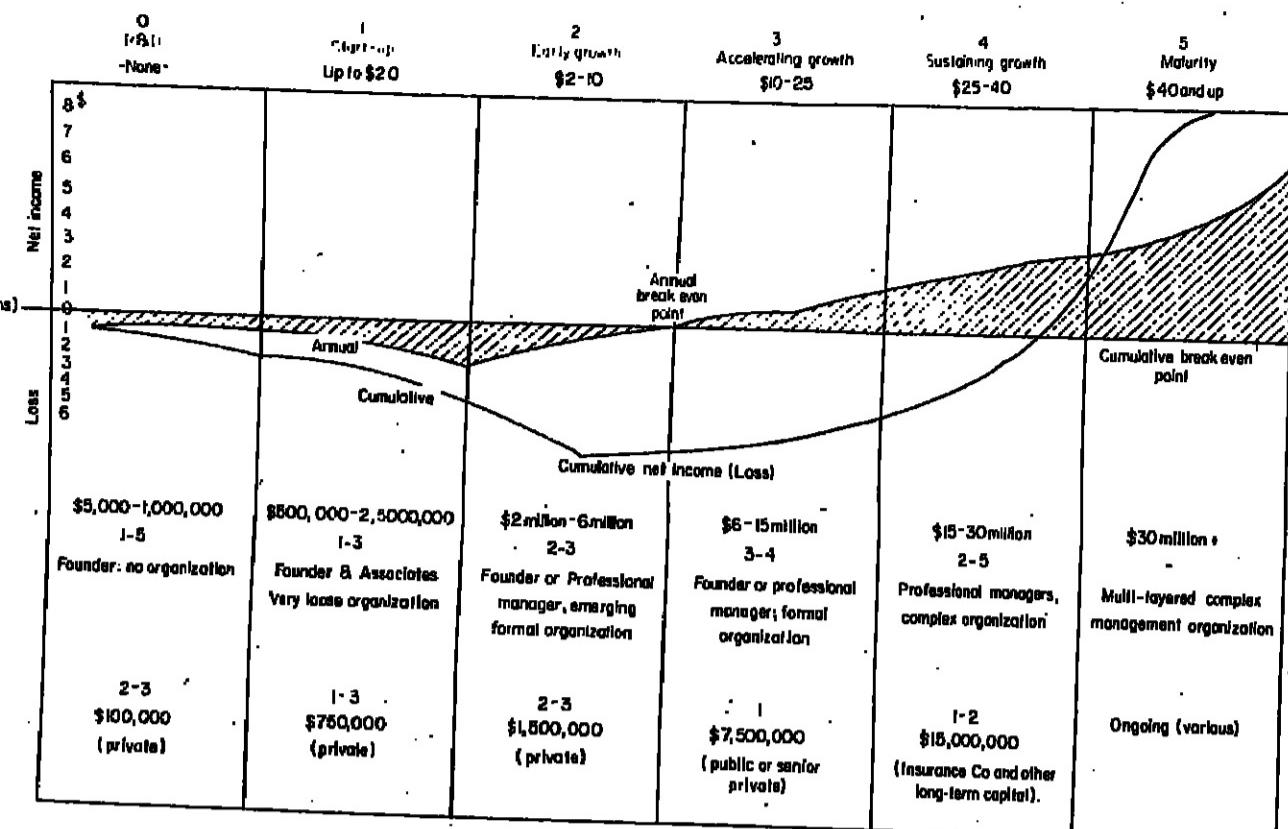
8

bit

data

bus

Phase activity level: revenues in millions



This table shows the life cycle of a new enterprise — a model of a growing and successful company.

COMPEC EUROPE '81

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MAY 5-7, 1981

Is an important specialist exhibition for all who are interested in small computers, peripherals, terminals and microcomputers. It is ideally suited to those who are looking for immediate, low-cost solutions to their computing problems.

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*Please note applications received after April 6 cannot be accepted.

by Kevin Cahill
Setting up your own company - 3

How to finance an expanding enterprise

In this third article on the care and financial maintenance of small computer companies, we look at some of the problems which are likely to face the entrepreneur as he or she moves from a one-man operation to larger things.

So far we have assumed that the operation is a one-man/woman company, maybe selling a contract service, or a consultancy. Because there is such a substantial difference between pure trading companies and a software or hardware manufacturer, we will assume for the remainder of this series that the company, like a lot of small computer companies, does a bit of manufacturing and selling.

The first thing to consider is the cash flow. Is there going to be enough money coming in fast enough to pay the bills as they fall due?

The key bill, as the company moves from sole proprietor, is wages. The salaries must be paid each month, whatever happens.

This, then, is the moment to look at the various start-up and equity-related loans available.

Basically, equity is an investment in a company, not a loan, and is usually recorded in the form of shares given to the investor.

The advantages of equity are that, unlike a loan, it is not basically repayable, and the interest is determinable by the company itself, in the form of dividends. The investor logically hopes to make an income from his investment and perhaps capital gains by selling his or her shares later. But the main advantage from a small company's point of view is that there is no burden of capital repayment.

Assuming that you are a small software house, writing software for the hardware you buy from an OEM manufacturer, and selling the results as a package, you are going to face two problems: You will have to pay your supplier, maybe long before you are paid yourself. And you are going to have to pay yourself and your programmers while you write test and implement the software.

If you consider your approach or your software unique, you may be able to get extended credit from your supplier. But beware — this road to ruin is paved with the corpses of small outfits which had the credit strings from a supplier drawn tighter than originally promised.

At this point you should consider the kind of capital needed to get you into a reasonably comfortable trading position. As a rule of thumb, look for equity capital to cover one year's trading. The Burclay start-up loan mentioned in last week's table should help most mixed software/hardware companies off the ground.

But suppose you have a project which will take more than a year to

get into production and into the marketplace. What then? Or if you have been expanding so that your initial capital is no longer covering your gap between sales and payments?

On the left is a table which shows the various stages of a growing company. You should try to match the growth of your company against the table and see what you should be looking for in terms of finance at any given stage.

By that year the biggest single market will be Western Europe, with annual expenditure of \$244 billion, followed closely by the US with \$211 billion. Japan will be spending \$95 billion by then.

The relative trade balance in electronics by the year 1991 will have Japan in surplus to the tune of \$40 billion and Western Europe in deficit by \$12 billion, he said.

COMPANY NEWS - 2

W Europe market to outstrip US by 1991

THE compound annual growth rate for the world electronics market, including computers, will be 8.5% through to 1991 according to Dr Ian Mackintosh.

Speaking to delegates at a Semicon/Europa meeting in Zurich recently Mackintosh said that the total electronics market would be worth \$850 billion by 1991, three times what he estimated the worldwide car market to be by then.

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Ulf Gustavsen, managing director of Norsk Data UK, will push software development for the Norwegian company in Britain.

Fast-growing Norsk sees UK as prime site for software development

NORWEGIAN computer company Norsk Data has revealed a doubling of profits for 1980, to just over £2.5 million from just over £1 million in 1979. Turnover for Norsk rose by £8 million to £25 million in 1980. The shares stood at just over 400 Kroner on the Norwegian stock exchange last week, up from 110 Kroner late last year (£33.40 against £9.90).

The company has recently installed systems at Hull College of Higher Education and at Pitman Press. The latter is an indication of a move out of the almost exclusively scientific and academic area to which it has been confined since opening in the UK with the installation at Exeter University's department of computer science.

The company has just won a £10 to £12 million order for the flight simulators for the American F16 fighter bomber, and the CERN project at Geneva now has over 150 Norsk computers installed.

Ulf Gustavsen, managing director of Norsk UK, refused to respond to questions about the possibility of UK financing for the company. Chairman of the Norwegian parent company Asmund Slogendal said that he would not rule it out but that there were no immediate plans for either a listing on the UK Stock Exchange or for raising private equity.

Norsk Data has just moved its UK office from London to Newbury and announced plans for a range of developments which could provide 20 to 40 more jobs in the area.

The company claims an annual growth rate, in terms of staff and sales, of 40% per annum for the past 13 years, and sees the UK as a substantial growth market for computers.

Slogendal said that plans for the UK were to continue to import machines from the Norwegian parent, but to do all the software and technical development locally.

It is very difficult to recruit suitably qualified software people in Norway, he added.

NEB makes big profit offloading ATS shares

THE National Enterprise Board has made another four-figure percentage profit on the sale of its stake in a high technology company.

The business plan should start at the very beginning, the edge of the team, which is to make the company. This can be in the form of a CV of each of the key members of the team.

Then you should set out how technical language a description of your company and its key products.

This is usually followed by a analysis of the markets in which you intend to sell your products, and your plan for organising & sales drive.

Naturally you need a cash flow and any other details of your financing needs.

After that you should put in other relevant material such as predictions of market growth in the area you intend to operate, as details of your supplier and contacts.

When you have finished it business plan take a long hard look at it and ask yourself whether you put into it the kind of money you are expecting others to?

• In the next article in the series we will look at sources of capital, bearing in mind the changes made for investors in the Budget.

CORRECTION: Last week's article on financing for the small computer company went to press before the Budget and included figures for companies which have since been renamed. Contact the relevant banks for details. An error showed that Norsk Data's last week's table should help most mixed software/hardware companies off the ground.

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get into production and into the marketplace. What then? Or if you have been expanding so that your initial capital is no longer covering your gap between sales and payments?

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THE table shows the closing prices in America on Thursday and the mid-day prices on Friday for London. The share index is based on the prices of the UK companies in the table. Highs and Lows have been adjusted where necessary.

Shares traded under the Unlisted Securities Market or under Rule 16(X).

Index: 97.68 Change: +0.00

Date 12/21	London Stock Exchange		US Stocks	
	Price	Change	High	Low
1981				
11/22	113	-1	114	112
11/23	112	-1	113	111
11/24	112	-1	113	111
11/25	112	-1	113	111
11/26	112	-1	113	111
11/27	112	-1	113	111
11/28	112	-1	113	111
11/29	112	-1	113	111
11/30	112	-1	113	111
12/1	112	-1	113	111
12/2	112	-1	113	111
12/3	112	-1	113	111
12/4	112	-1	113	111
12/5	112	-1	113	111
12/6	112	-1	113	111
12/7	112	-1	113	111
12/8	112	-1	113	111
12/9	112	-1	113	111
12/10	112	-1	113	111
12/11	112	-1	113	111
12/12	112	-1	113	111
12/13	112	-1	113	111
12/14	112	-1	113	111
12/15	112	-1	113	111
12/16	112	-1	113	111
12/17	112	-1	113	111
12/18	112	-1	113	111
12/19	112	-1	113	111
12/20	112	-1	113	111
12/21	112	-1	113	111
1982				
1/2	112	-1	113	111
1/3	112	-1	113	111
1/4	112	-1	113	111
1/5	112	-1	113	111
1/6	112	-1	113	111
1/7	112	-1	113	111
1/8	112	-1	113	111
1/9	112	-1	113	111
1/10	112	-1	113	111
1/11	112	-1	113	111
1/12	112	-1	113	111
1/13	112	-1	113	111
1/14	112	-1	113	111
1/15	112	-1	113	111
1/16	112	-1	113	111
1/17	112	-1	113	111
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1/24	112	-1	113	111
1/25	112	-1	113	111
1/26	112	-1	113	111
1/27	112	-1	113	111
1/28	112	-1	113	111
1/29	112	-1	113	111
1/30	112	-1	113	111
1/31	112	-1	113	111
2/1</td				

When a program needs a copyright notice



MANY books, pamphlets, journals, articles and - increasingly - computer programs contain, at or near the beginning of the work, a notice of copyright.

What is the purpose of the notice, and when and where should it be fixed to a computer program? The first point to emphasise is that a copyright notice is not a requirement of UK copyright law and conveys no advantage to the UK owner of a copyright work in this country. The purpose of the notice is to obtain the benefit of copyright protection for published works overseas.

There are two major international copyright treaties, the Berne Convention dating back to 1886 and the Universal Copyright Convention established under the auspices of UNESCO in 1952. The UK is a member of both.

The Berne Convention requires no formalities for the exercise of the rights it confers, whereas the UCC, which offers a lower standard of protection, provides that all formalities are satisfied if from the time of first publication all copies bear the symbol © accompanied by the name of the copyright proprietor and the year of first publication.

A copyright notice is therefore required for works which are published in countries that are members of the UCC but not of the Berne Union. The principal country in this category is the US and in practice the primary reason for affixing a copyright notice is to secure protection there.

Under the 1909 US Copyright Act, failure to include a notice, or a correct one, could seriously affect copyright protection or, as in the Data Cash case, eliminate it altogether. Under the 1976 US Copyright Act (which came into effect on January 1, 1978) an accidental omission is not quite so serious but nonetheless it is still important to include the notice in the right form on all published copies.

The copyright notice consists of three elements: the internationally recognised symbol © which tells the reader that copyright is claimed; the year of first publication;

Bryan Niblett

DOWNTIME

There's no such thing as bad publicity!

WHEN the Beatles arrived in New York on their first visit to the States, they were greeted by an enormous cheering crowd like none there had seen since Val Day.

Asked what he attributed such enthusiasm before they had even given their first concert, John Lennon replied: "A good publicity agent."

I was reminded of this by a shock story in the Daily Express.

For expert opinion I turned to

about The Last One, the software generator that has been the subject of a 1974 piece and some correspondence in this newspaper.

"I used to beat all computers," said Britain's 'Computer King' in an interview with the Express, bemoaning the failure of British industry to back the product which threatened to make redundant the young army of human programmers.

"Never mind the cynics who say software generators have been

editor of another computer magazine describing the program as 'the philosopher's stone.'

"We're the Express," failed to mention was that the editor in question wrote letters to several publications, including this one, asking them to write about The Last One and to plug his magazine in the process.

"Great stuff man! If you can convince the Daily Telegraph and the Daily Express, you should have no trouble with the Japs, Americans, and Germans, and Britain will be great again!"

around for years. We need more of this enterprise. We are always hearing how British products are great technically but badly marketed - how good it is to see men with real sales acumen at last.

Great stuff man! If you can

convince the Daily Telegraph and the Daily Express, you should have no trouble with the Japs, Americans, and Germans, and Britain will be great again!"

ARL: the public and those who inform them really getting more glued up about computers than they were? I wonder. You may remember me ranting in January about the Design Council exhibition in which various cardboard mock-ups were shown as examples of wonderful new microtechno-

logy. Wouldn't it be nice if we had a good vacuum cleaner? Huh?

What it would look like?

Yes, indeed it would be nice. It would also be nice if we had a pill to cure all diseases so let's have a debate on whether it should be red or blue. So if the catch-up to be

done is now produced by

the round-trip:

It does, which is the 1974 piece opposite kindly sent in by John Hollmann.

The author of the piece is trying to say that the machine does not actually work. It is a gleam in the eye of the youths at North

affordable Polytechnic.

High road and low road procedures

CONSIDER a class of computing problem for which all sufficiently short programs are too slow and all sufficiently fast programs are too large. Most non-standard problems of this kind were left strictly alone for the first 20 years or so of the computing era. There were two good reasons.

First, the above definition rules out both the algorithmic and the database type of solution. Second,

at a pinch a human expert could usually be found who was able at least to compute acceptable approximations - for transport scheduling, job-shop allocation, inventory optimisation, or whatever large combinatorial domain might happen to be involved.

Let us now place problem-solving by machine in the more precise context of evaluating two particular kinds of finite functions:

s: *Situations* → *Actions*, and t: *Situations* → *Actions* - *Situations*.

These expressions say that s maps from a set of situations (state-descriptions) to a set of actions and that t maps from a set of situation-action pairs to a set of situations. The function symbol s can be thought of as standing for "strategy" and t as standing for "transform". To evaluate s is to answer the question: "What to do in this situation?" To evaluate t corresponds to "If in this situation such-and-such were done, what situation would be the immediate result?"

If it has been possible to couple causal models with various kinds and combinations of search, mathematical programming and analytic methods, then evaluation of t has been taken as the basis for

cycling, we could probably construct a serviceable lookup table of such a frame-by-frame examination of filmed records of bicyclists in action. But it would certainly be too large for such an approach. The only way to predict the next frame of a filmed sequence would be by numerically computing a Newtonian physics model of the bicycle, its rider and the terrain.

Machine representations corresponding to s and t are often called heuristic and causal respectively. Note that they model different things. The first models problem-solving skill but says nothing about the problem-domain. The second models the domain including its causality, but in itself says nothing about how to solve problems.

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Donald Michie is Professor of Machine Intelligence in the University of Edinburgh.

Computer Weekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, March 19, 1981

Role of the unions

TRADE unionism is not generally strong in DP departments, for a variety of reasons. One is that computers have been adopted most readily in sectors like banking and insurance where unions are docile and employers have a strong streak of paternalism.

Chiefly, however, it is because computers have replaced usually non-unionised clerical jobs held by the meekest parts of the workforce - women and younger employees.

The fact that there has been no painfully-forged trade union tradition to buy out has in large measure allowed the benefits of computerisation to be rapidly earned. Subsequently a part of those benefits has gone to pay a new elite in the workforce - the computer programmer and his ilk.

He (and she) has been far too much in demand to need to worry about organising with colleagues to

Mate means no more noses to grindstone for disabled programmers



by Pamela Rowe

THE Computer Weekly Ball of 1977 wasn't just a good time for all; it also sponsored a project to help the disabled - Mate II, a microsystem which can be operated by one digit, be it toe, finger, or nose, and which can also control the domestic environment, drawing curtains, opening doors and switching on lights.

The Microprocessor Assisted Terminal Equipment project, in full, all started unobtrusively enough, as these things do, with girl student at Essex University. Margaret Pearce was disabled and could only use a pen in her mouth. To help her, the computer department designed a light-touch keyboard for the teletype equipment they already had.

In route to this Brian Wilby and Martyn Lankester, the original members of the Mate project group, heard of a similar case at the Keweenow Day Centre and paid the centre a visit.

Here they met Geoff Busby, a programmer/analyst with Marconi in Chelmsford, who had an "operational nose", and who was attached, via a lever to an arm, and a spring to a leg, to a Heath Robinson mechanical device.

His nose was obviously taking quite a strain and as Wilby said, "we could see that poor Geoff's nose was getting very red, and we felt sure we could do something better for him."

They produced, in fact, the light-touch keyboard with facilities for sequential rather than simultaneous operation of the control and shift keys. The key is effectively "remembered" by the processor and is applied only to the key immediately following. The

team had already worked out that the majority of control/shift operations are used for one character only.

This was the point at which both Computer Weekly and the British Computer Society became involved - through Busby's participation in the BCS Committee for the Disabled - and when Mate I became Mate II.

Mate II was to be an intelligent version of its predecessor with enhanced word recall and editing facilities. Despite the entirely voluntary services of the group, given freely in their spare time, the project now needed money, and the ball raised some £1,500 to be administered by the BCS.

All along, Essex University has supported the project with encouragement and facilities.

The initial design, completed in 1978, called for custom-made software under a specialised operating system, since at that time there were no suitable packages available. The Mate group accordingly enlarged to include Dr R. G. Blake and Michael Coad, both of Essex University, and M. Langton from the Gilbert School, Colchester, advising on the ergonomics of the equipment.

But there it stopped; and there was a long hiatus while everyone tried to agree on how the money should be spent. Meetings were held and committees called, the slow business of bureaucracy taking over. More important to the project group was the official go-ahead necessary to further work on Mate II.

Meanwhile back at the computer industry, technology was changing fast, and in the event, the delay proved an advantage. When, last summer, Mate II was on again,

The word store on the prototype

is arbitrarily set at 50K, but this could be 100K or 150K as desired. Each store can contain roughly as many individual blocks or phrases as there are printing characters on the keyboard - approximately 5K-bytes of space.

Word tables not in current use can be stored on a magnetic disc, giving almost limitless capacity, and insertion and editing facilities allow for tailor-made tables to suit a particular task. Mate recognises the first word of a sentence from store, promoting the leading letter to upper-case, and takes care of line wrap-around.

Domestically, Mate is a real friend and would be appreciated by even the merely tired. It can be set to draw curtains, turn lights on and off and open and shut doors,

'copy a floppy', Present cost of Mate II varies with the hardware. If based on the Vector Graphic B it works out at about £2,500, including Microvis 5½in floppy disc drives with capacity of 315K (or 630K if doublesided) screen and keyboard. The cheaper version costs about £1,500.

The main aim of the project group is still to help the disabled be less apart from his fellow workers - they call Mate II "a aid to job opportunity".

They see it as helping the programmer with practical problems, the disabled businessman to cope with his documentation, and a disabled child to keep up with his peers in the classroom, despite a mechanical handicap.

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VIDEOTEX, Viewdata, Oracle, Prestel, Ceefax, Viewtron... Do they all whirr in a communications vortex, in which only clear fact to emerge is that telephone boxes will be painted yellow? If so, stick close, and hitch a lift on the guide to telesoftware.

The generic name is videotex, which can be broken down into teletext - broadcast material with serial access; and viewdata - telephone linked and allowing random access. In the teletext category are Oracle and Ceefax, both of the UK, and Anticop from France. Viewdata includes Prestel (UK), Viewtron (US), Telenet (Canada), Captain (Japan), Telset (Finland), Vidnet (Netherlands); and Bildschirmtext (West Germany).

The three UK systems, Ceefax, Oracle and Prestel, have all been used quite extensively to support education. Apart from a little collaboration on special projects, Ceefax backs up BBC programmes, Ceefax Exploring Sciences for schools, and Merry-go-round, while Oracle is the Independent Broadcasting Authority version, used mainly for adult education.

A form of interaction is possible using a response frame facility. Theoretically one could sit at home and select, enrol, and even pay for the evening class of your choice without even opening the door. But this doesn't apply to the Oracle on those cold, wet November evenings. The facility is expensive, though, and has had only limited use.

Prestel is organised by British Telecom, which means it is simply the common carrier of data. Three other groups involved are the data organisations, which can cost them more than peanuts; the television manufacturers, so far a little slow with mass production of picture

sets; and the users, currently about 8,000 of whom have become the modern pioneers of the telephone.

The Council for Educational Technology has set up an umbrella service near London to help educational institutions and slightly buffer against the high charges. Some august names are concealed by this umbrella - the Open University, the National Extension College, Schools Council, British Universities Film Council, Business Education Council, National Federation for Educational Research, the Technician Education Council, the National Audio Visual Aids Centre and the Council for National Academic Awards.

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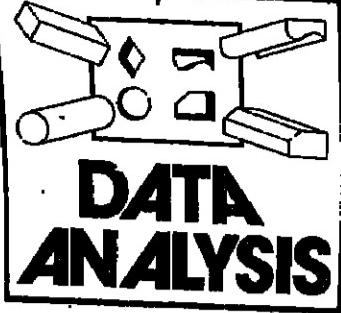
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Beginning database design using information collected

In Part 21 we started to look at how the results of analysis could be used for system and database design. Aspects of application system design were discussed, and as a result of this stage a sub-set of the functions was selected based on the frequency of the functions, their importance, mechanisms required, response required and other cost/benefit criteria (function filtering).

This week the sub-set of functions will be used to consolidate the information collected so far during the analysis stage and the resulting information used for database design.

In Figure 1, a form called the attribute usage matrix is shown. This is the last data collection which is required from the analysis stage and shows the attribute types used by the functions.

The information on this form indicates the pattern of usage of attribute types, and can pinpoint inconsistencies, e.g. Date of Discharge appears to be stored but never used. It also shows the sub-schemas required for each program implemented using the function.

During access path analysis, estimates of data usage were collected on the access path for a

Entity type:- Patient		Attribute usage							
Function		Admission	Nurse's Inquiry	Discharge	Record patient's details	Record patient's history	Doctor's Inquiry		
NHS number	R	R	R	R	S	S	R		
Sex	R	R	R	R	S	S	R		
Date of birth	R	R	R	M	M	S	R		
Marital status	R	R	R	M	M	S	R		
Hospital status (in-patient/out-patient)	R	R	R	M	M	S	R		
Date of death	R	R	R	S	S	S	R		
Date of discharge	R	R	R	S	S	S	R		
Date referred	R	R	R	S	S	S	R		
Surname	R	R	R	R	S	S	R		
Title	R	R	R	R	S	S	R		
First name	R	R	R	R	S	S	R		
Second name	R	R	R	R	S	S	R		
Maiden name	R	R	R	R	S	S	R		
Ward status (booked, resident, null)	M	M	M	M	S	S	R		
Cause of death					S	S	R		

R=Retrieve S=Store M=Modify D=Delete

Figure 1. Attribute usage matrix.

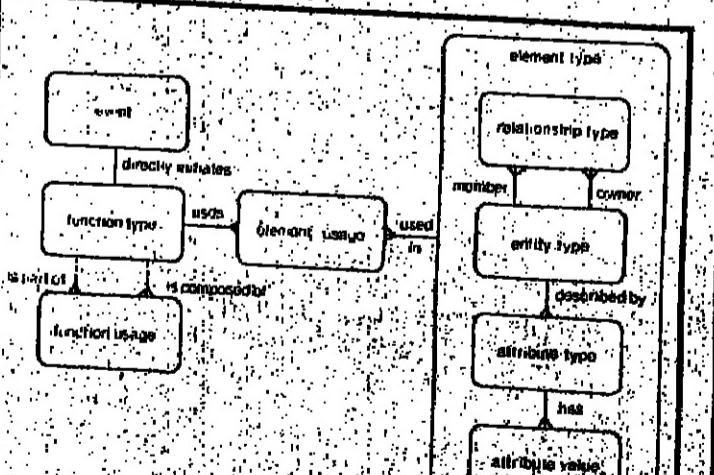


Figure 2. Simplified entity model showing element type usage.

Function type	Element type	Category of element	Action	Volume
Function	Patient	E	R	10
Death	Patient undergoes operation	E	R	50
Death	Operation	A	M	50
Death	Sex	R	R	10

Figure 3. Element usage.

Figure 4. The entity types and attribute types of data analysis.

Figure 5. Commodity summary of access to an element.

Section II - Part 2

of our series describing a system design methodology

by Rosemary Rock-Evans

In Figure 5 a description of how accesses on an element are calculated is shown as a "structured English" description. It should be self-explanatory. The results - Patient retrieved 700 times per day; Operation stored 5 times per day; Operation undergoes Operation retrieved 200 times per day, etc - are logical accesses and must be converted according to the DBMS being used to obtain physical accesses.

All this information is now available to begin design.

Working from the entity model, there are several options open to the database designer. The main ones are given below:

1. Entity types.
1.1 An entity type can be represented by a single record type.

1.2 An entity type can be split into sub-types and record types created for each sub-type.

1.3 An entity type can be split to form two or more record types, each with different attribute types.

1.4 The entity type is not implemented using the DBMS. It becomes a transaction file, a conventional file or even the working storage of a program. For example, Patient Key (NHS no) in the Operation record.

1.5 The entity type is not implemented.

1.6 Entity types are grouped to form one record type, e.g. Order and Order Lines, with Order Lines as repeating groups within the Order record type.

2. Attribute types.
2.1 An attribute type is represented by a data item.

2.2 An attribute type is represented by more than one data item (i.e. duplication for efficiency reasons).

What criteria does the database designer use to decide how to map the entity type, attribute types and relationship types into records, links, and data elements?

Some of the points he/she should consider are listed below:

a) Confidentiality/privacy.

b) Security requirements.

2.3 An attribute type is not represented within the DBMS - it becomes the working storage of a program, part of a conventional file, etc.

2.4 An attribute type is not implemented.

3. Relationship types.

3.1 A relationship type is directly represented by one DBMS link or Codasyl set. (*Dependent on 1.1*)

3.2 A relationship type is split according to the different entity sub-types into more than one DBMS link or Codasyl set. (*Dependent on 1.2*)

3.3 A relationship type is not implemented. (*Dependent on 1.5*)

3.4 Several relationship types are implemented via one DBMS link or Codasyl set. The different relationship types are identified either using different record types or by an identifying data item.

3.5 The relationship type is implemented by using the identifying attribute type of the owner in the member record type. For example, Patient Key (NHS no) in the Operation record.

3.6 A relationship type is implemented using an additional record type or link (dependent on restrictions of DBMS).

What information is available on which to base the decision on how to map the entity types, attribute types and relationship types to record types, links, data elements, etc? The information collected is listed below:

1. Function Forms.

2. Entity Type Forms.

3. Attribute Type Forms.

4. Relationship Type Forms.

5. Element usage (Access Path for a Function and Attribute Usage forms).

6. Summary of element usage.

Examples:

1. Which attribute types are confidential?

- Use the Attribute Type

c) Volume of elements.
d) Response required, e.g. online, batch, etc.

e) Degree of relationship type (e.g. if fixed degree, may do 1.6).
f) Life of element, i.e. how long is it required in the system?

g) Which relationship types are fixed/defined?

- Use the Relationship Type Form. The result may be that the entity types are grouped to form one record type (1.6).

h) One transaction
- More than one transaction

i) Criteria used for selection of element. This may result in secondary indexing being required.

j) Priority of functions.

k) Patterns of element usage - which elements are used by the most important and most frequent functions.

l) Frequency of use of elements and groups of elements:

- Not used

- Used frequently/infrequently

- Elements are used very frequently because of high volume of traffic.

l) Patterns of element occurrence, for example, which attribute types may not be present for all the entities of a certain type (may result in 1.2).

m) Consistency.

THE Association of the European Independent Informatics Industry (EII) has restructured its executive board. The association was formed in January last year, to promote the interests of small and medium-sized European manufacturers of data processing equipment, and to provide a voice for industry in dealings with the EEC Commission and other international bodies. It has over 70 member companies.

Other members of the board are: Executive vice-president Donald Willis (representing the UK), who is business development director of Data Recording Equipment, and governor of Christ's Hospital; vice-president Peter Sonnen (Denmark), president of RC Computer; treasurer John Cordier (Belgium) president of Telindus; Peter Dietz, president of Dietz Computer Systems and Johannes van Byberg (Holland) an executive of Philips in Holland.

■ Terry Forrester has been appointed Northern Region sales manager at Package Programs Ltd (PPL). He was formerly ICL. Also joining the company is Mike Pritchard, who comes from Kalle Infotec as sales executive responsible for the West London and Middlesex area.

■ Robert James, vice-president and treasurer of NCR, has been appointed vice-president of office systems for the company.

■ Jim Turner has joined CAP-CPP as new business manager. He was previously head of the mathematics and computer applications department of International Research and Development.

■ Ken Oliss has been appointed VS marketing manager at Wang. He was formerly Series 1 product manager at IBM.

■ Michael Lyons has been appointed managing director of DataStor. He joins the company from SPL International where he was director responsible for the Scandinavian area.

■ Ron Burnip is now European marketing manager at AMI. He joined the company in 1976.

■ Alastair Day and David Stark have been appointed leasing executives at Oceanic's finance division. Before joining Oceanic, Day was leasing manager for British Rail Services and Stark was sales executive with Systime.

■ John Tregurtha has been appointed specialist sales executive at Rain, concentrating on OEM customers for the company's Black Box range. He was formerly technical consultant with CAP.

■ Tony Middleton has been promoted from operations manager to commercial manager of the commercial systems division of Host (Hooper Systems and Technology).

PEOPLE

Industry 'voice' in EEC restructured



Forrester



Pritchard



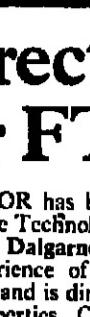
James



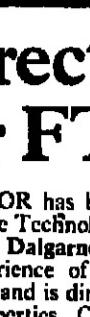
Turner



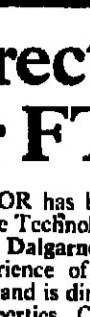
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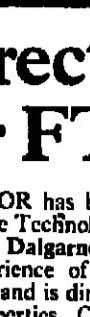
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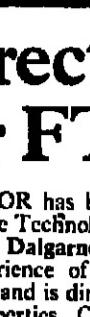
Burnip



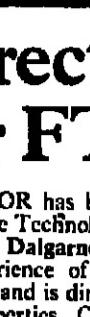
Day and Stark



Tregurtha



Middleton



Dalgalano

A DIRECTOR has been appointed at Future Technology Systems (FTS). Fred Dalgalano has considerable experience of business at board level, and is director of Ballownie Properties, Castle Forbes Golf and Country Club, Melville Street, Investments, Thorngrove Investment Services and Amstel Group, of which he is chairman.

He graduated from Aberdeen University as Bachelor of Law in 1964 and in 1965 went to Strathclyde University where he gained a Diploma in Industrial Management. During the next three years he served his apprenticeship as a chartered accountant in Aberdeen. In 1968 he joined Pwll and Williamson, solicitors and estate agents, later becoming a partner in the firm.

■ Andrew Mayo has been appointed personnel manager at Dataskill. He was previously sales and support personnel manager for ICL's UK Division at Putney.

■ Tony Kinsella has joined Office Technology as financial controller. He was previously with ICL.

Top appointments at Computer Resources

THREE new appointments have been made at Computer Resources. Kevin Hughes and Barry Hadfield, both of the Manchester branch of the company are small business systems manager and treasurer of the company respectively. They have been appointed vice-president of office systems for the company.

■ Jim Turner has joined BA Electronics as sales manager. He was formerly with Consort Electronics.

■ Michael Lyons has been appointed managing director of DataStor. He joins the company from SPL International where he was previously technical manager for the Scan-danish area.

■ John Tregurtha has been appointed specialist sales executive at Rain, concentrating on OEM customers for the company's Black Box range. He was formerly technical consultant with CAP.

■ Tony Middleton has been promoted from operations manager to commercial manager of the commercial systems division of Host (Hooper Systems and Technology).

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The level of interest is 'enormous'

From page 21

Shape Data's computer. Then a commission followed for them to write some programs which were loaded onto a service bureau computer. As use of the programs built up, the company bought its own computer, as well as Shape Data's software tools so that they could develop programs themselves.

Now, after four years, the company has made a complete switch to the new technology; it no longer makes any manual drawings for the design of pump volutes, and producing prototypes now takes a few weeks instead of several months.

Shape Data now has 13 employees and its software is distributed in the US and Canada by Evans and Sutherland Computer Corp of Salt Lake City.

A major thrust at the Cadcentre has been in chemical engineering and the process industries. The Cadcentre employs 150 people, 120 of whom are technical staff, equally divided into computer scientists and professional engineers.

One of its earliest projects was the Gino software, a Fortran graphics package dealing in simple line graphics in 2D and 3D. Later development in graphic applica-

tions range from laying out pipes in a petrochemical works to designing shows or simulating the way a machine tool cuts metal.

A new area being developed is image processing, which is built on colour graphics.

The Cadcentre's prime objective is to evolve better CAD/CAM systems through undertaking joint projects with industry. Some companies pay for the service in full and others apply for a 50% government grant. Last year the Cadcentre cost £3.2 million to run and recovered £1.5 million through services and royalties on software licences.

For the construction industry, ARC has developed two approaches. ARC grew out of the University's School of Architecture in 1969 and its experience has enabled it to produce a combination of 3D modelling and a wide draughting capability.

This company's BDS package is a modelling approach which makes a 3D computer model of a large complicated building (it was originally used for a hospital), from which assessments and analyses can be made.

General Draughting System, GDS, is intended to carry out all functions required of draughting in the construction industry, from

producing maps to site layouts and engineering details. GDS has been used to design an airport terminal and is being used by the Property Services Agency, for its Post Office telecommunications headquarters.

Two other industries to benefit from the Cambridge graphics phenomenon have been cartography and security printing. Laser Scan's high resolution display and plotting capability serves both, as demonstrated by the HRD1, which has a high resolution of approximately 8,000 lines in each axis and a large screen display.

The high resolution display is used for security printing because of its ability to produce direct hard copy output. People producing sensitive documents can check what they see on the display screen before producing a hard copy from which they can print.

Laser Scan's contribution to cartography has been not only in display and plotting, but also in producing software to run on such machines, and more recently on other people's machines. Laser Scan has sold about 16 HRD1s (at £60,000 each) to clients as varied as the Ministry of Defence and the mining industry.

At the moment Laser Scan's Fastrak Digitiser is only used for

cartography, but the company hopes it will be used for engineering drawing digitising.

Laser Scan's microfilm plotter is the company's first component for a system. The resolution falls somewhere between the very fast, but expensive, CRT devices and the conventional and relatively cheap pen plotters.

After many years of relatively quiet development in CAD/CAM techniques it is exciting to find growing awareness that CAD/CAM systems now have the potential to save many of Britain's hard-pressed industries. These Cambridge graphic firms not only have the technology, but they are realising the importance of packaging and marketing. From the consumer's point of view, the problem is what to choose, how to sort out the different systems and how to interpret what different suppliers mean by the same jargon word.

● To provide the consumer with information and guidance, the Cambridge graphic firms are organising their first conference, Called Investment in CAD/CAM Technology and open to anyone, it is being held at Churchill College, Cambridge on Tuesday March 24. For details write to CAD/CAM Publications, 170a Park Road, Peterborough, PE1 2UF.

User markets expand as costs are cut

by Howard Rippiner

SINCE the early days of computers, there has been a requirement for the pictorial representation of data, but initially the generation of graphics required a great deal of computing power and memory capacity, which made it too expensive for general-purpose use.

However, in 1968 the development of the bistable direct-view storage tube opened up the market for lower-cost graphics terminals, and when the first commercial terminal using this approach was introduced in 1971, it cost less than half the price of its nearest equivalent.

The first storage-tube devices to come on to the marketplace offered a display capability of 266 line pairs, which meant that the user could address 1024 points horizontally and 780 points vertically. As the need grew for increased graphics complexity, manufacturers developed larger screen terminals as well as techniques for "zooming" in on a particular section of the graphics picture. At the same time, terminals offered more comprehensive graphics facilities including different hardware-generated character sizes, line types, etc.

Built-in microprocessors have added intelligence and storage capabilities to the basic graphics terminal. Typical of the features offered is the ability to call up local "macros" consisting of standard, regularly used shapes and local picture editing has become standard on many systems. Digitising tablets and flexible-disc stores add further to the terminal's manipulative and storage abilities, as well as minimising the need for data communication with a host computer.

One of the most important developments in recent years has been the combination of refreshed display information with data retained on the storage tube, which means that selected foreground information can be manipulated against a background of high-resolution stored data. The refreshed graphics facilities allow the user to display, select and manipulate moveable pictures, while the storage facilities allow the display of very large amounts of graphics and textual information without a flicker.

Another important sector of display technology uses raster-scan techniques to build up the graphics picture. Raster-scan displays have come into their own recently because of their ability to produce colour graphics, which has compensated for their relatively limited resolution. Colour is becoming increasingly important in many graphics applications, such as computer-aided design, process control, mapping and architecture, where several different levels of information need to be overlaid or combined simultaneously without confusion.

Raster-scan displays have also brought about significant improvements in the merging of graphics and alphanumeric symbols in the same picture. The availability of low-cost video chips and lower-cost memories has stimulated the development of techniques such as the virtual bit map, which allows many pages of data to be stored with full facilities for scrolling the data.

In virtual-bit mapping, the operating system uses a software program to establish a graphics region on the display screen. The rectangular graphics region can be displayed anywhere in the display area, with the remainder of the area considered as alphanumeric. The graphics region is then further divided into graphics cells, and the program is arranged so that graphics memory is allocated only to those cells containing graphics information. The remaining graphics cells appear in the display list as

GRAPHICS - 3

A picture is worth a thousand words in company computing

by John Dimmock

MOST people are aware of the many changes that have been brought about by the rapid increase in the use of computers throughout industry and business. Not quite so obvious, but perhaps more significant, are the changes taking place in how companies are utilising their computer facilities.

One area where this becomes quickly apparent is in computer graphics. This section of the computer market is currently enjoying the fastest growth rate within the industry, and the reasons are well known.

A designer can develop ideas and feed them into a system at the beginning of the design phase and not just before documentation is needed. These ideas can be manipulated visually to produce designs and drawing files from which working drawings and data can be reproduced at high speed on the plotter.

The first choice is usually between a pen or electrostatic machine. The latter offers very high speed output and can double up as a printer and hard copy device. Traditionally electrostatics were used as a "quick look" device, with a pen plotter for final plots, but as drawing quality is improving all the time they are becoming more than an acceptable alternative, and for applications where shading and imaging are necessary, electrostatics are ideal.

If the drawing requirements are better served by use of a pen plotter, the choice then is which type of machine to use. A flatbed uses single sheets of paper so plots can be removed and put back later to add more details. Overplotting on to pre-printed sheets can be carried out; valuable for surveying, cartography, weather mapping etc.

As these benefits became accepted, a demand came from other fields, notably in electrical and mechanical engineering, local government, hospitals and a wide range of research applications.

The decision to purchase a computer system in these organisations was usually made for reasons of improved efficiency and reduction in overhead costs leading to an increased return on investment. Once installed the system, if efficient, did just that, but usually created new administrative problems in its wake for management to iron out. For example, vast quantities of digital data presented in a form which was unfamiliar to the staff now had to be checked, cross-checked and somehow presented in a way that could easily be assimilated. Of course, all this data was accurate, but humans had to analyse it and act on the results.

The big advantage of calligraphic displays is their ability to handle dynamic information, so their use tends to be restricted to applications where this is an essential feature and where cost is not a primary consideration. Flight simulation is a typical example.

However, intelligent graphics terminals and desk-top graphic computers are now available with a significant amount of refresh capability and have made it a potential market for calligraphic displays.

Another important sector of display technology uses raster-scan techniques to build up the graphics picture. Raster-scan displays have come into their own recently because of their ability to produce colour graphics, which has compensated for their relatively limited resolution. Colour is becoming increasingly important in many graphics applications, such as computer-aided design, process control, mapping and architecture, where several different levels of information need to be overlaid or combined simultaneously without confusion.

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In virtual-bit mapping, the operating system uses a software program to establish a graphics region on the display screen. The rectangular graphics region can be displayed anywhere in the display area, with the remainder of the area considered as alphanumeric. The graphics region is then further divided into graphics cells, and the program is arranged so that graphics memory is allocated only to those cells containing graphics information. The remaining graphics cells appear in the display list as

spares, with the result that the overall memory requirements are greatly diminished.

The addition of colour to the graphics display requires a change from a single memory plane to three memory planes, with side-mounted planes offering a choice of eight colours. A combination of hardware and software techniques allows any selection of eight distinct colours to be made from an overall palette of 64, and the mixing of dots of different colour allows additional colours to be generated. In fact, it is possible to generate a picture containing 18 distinct colours from patterned mixtures of the eight basic ones.

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The quiet operation of flatbeds can make them suitable for the normal office. Size for size they usually cost more than drum machines, but offer flexibility; various types of paper material can be used.

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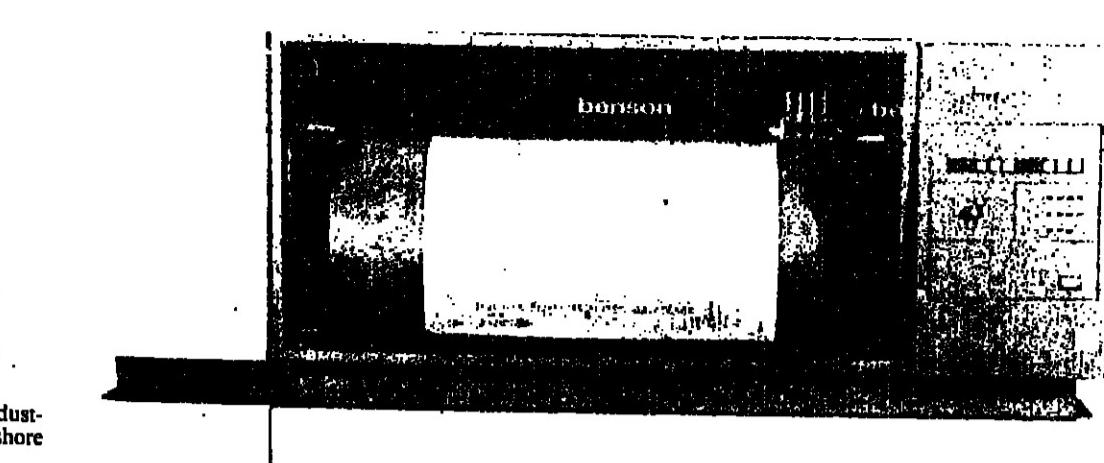
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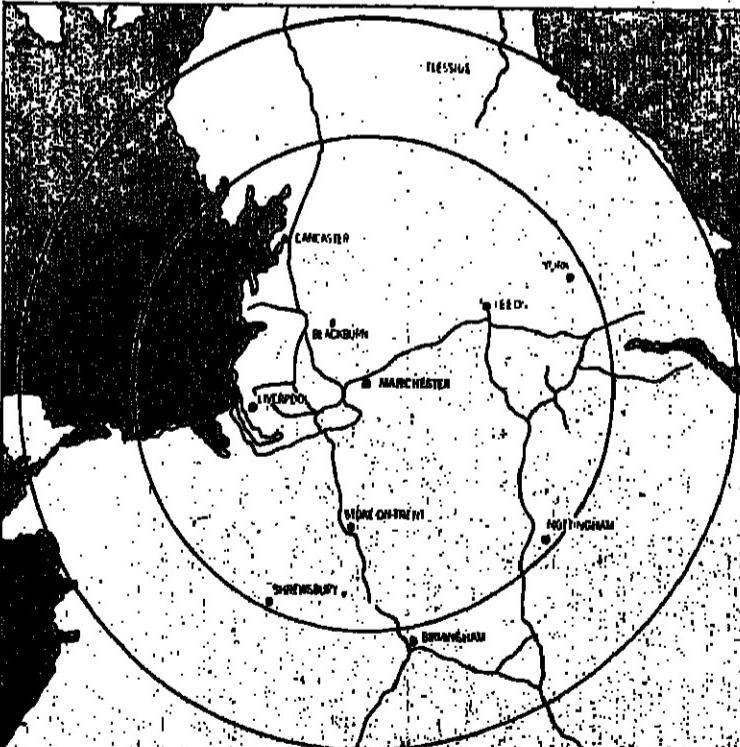


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to be involved in the
development of the products
we produce.

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We are looking for people
with a desire to

Excellent Contracting Opportunities

Our immediate domestic and international contracting needs are detailed below. If you are of a professional disposition, skilled, and dedicated and wish to join our growing permanent or contract staffs please contact us in respect of these and future opportunities.

INTERNATIONAL

System 34/Cobol	Consultant-Programmer	Caribbean/Africa/Europe
Mark IV	Consultants-Programmers	New York/Texas/Paris
IBM/Cobol	Programmer/Analyst	Africa
IMS or TOTAL	Analyst-Programmer	Oman
U.K.		Holland
Mark IV	Programmers/Analysts	London N.W.
Cobol/CICS/DL1	Senior Programmer	Essex
Assembler/CICS/DL1	Programmers	London
RPG/System 34	Programmer/Analyst	S. London-London
IMS	Designers-Analysts-Programmers	Essex
Cobol/Univac/Exec	Programmer/Analyst	Essex
Cobol/Filetab	Programmer/Analyst	London
HP 3000/Cobol	Programmer/Analyst	

For more information telephone:
Alan King
TANGENT COMPUTER SERVICES
102108 South Street
Romford, Essex
Tel: Romford 700261

(4720)

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DIRECT LINE
01-661 0121



Geosurvey

Senior Technical Programmer

Geosurvey International require a Senior Programmer to join a team engaged in processing and interpreting airborne geophysical data on SEL and PDP equipment. At least 5 years' technical experience is essential. Graphics applications experience would be an advantage. To arrange an interview contact: Data Processing Manager, Geosurvey International Limited, Geosurvey House, Orchard Lane, East Molessey, Surrey KT8 0BY. Telephone: 01-397 0591 or 01-398 8371.

Senior Analyst/Programmer

West Yorkshire up to £9000

Ronold Limited is a worldwide group with annual sales in excess of £125 million. The company's primary business is the manufacture and distribution of power transmission products; the Bradford unit concentrating on precision gears.

Following a decision to decentralise computer facilities our client wishes to recruit a senior analyst/programmer to take charge of a computer department at present in the process of formation. He or she will report to the office manager, assist with recruitment of additional staff and be responsible for the formulation of a 3.5 Mb ICL M29. Existing computer applications will be transferred to the new computer, whilst new systems will be introduced for which it is expected that packages will be evaluated. Candidates should have sound programming and analysis experience gained with on-line ICL equipment, preferably including stock and production control techniques.

This is a distinctive career development opportunity for a self-reliant individual with team leadership ability.

Please send career details in confidence to: Mrs. S. J. Linton, Executive Selection Division, Ronold Limited, Bond Court, Leeds LS12 8SN. Telephone: 01-2414.

WATERHOUSE
Watertech
Watertech

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

CHAIR OF COMPUTER SCIENCE

Applications are invited from suitably qualified persons, regardless of sex, race, colour or national origin, for appointment to the above Chair. Computer Science is currently a Division of the Department of Applied Sciences, but is to become a fully independent Department in the near future. The successful applicant will be expected to develop and lead the new Department in its teaching and research efforts. Computer Science is recognised as a leading discipline in its professional discipline in which experience, standing and of high quality; it is intended that it should remain so. A twin CPU Tandem installation is in operation. The successful candidate will help to accelerate the professional development of this team.

Interested persons should obtain the Information sheet relating to this post from the London Representative, University of the Witwatersrand, Chichester House, 276 High Holborn, London WC1V 7HE, or from the Registrar (Staffing), University of the Witwatersrand, Jan Smuts Avenue, Johannesburg, South Africa 20010. Applications should be lodged not later than 7th April, 1981.
(4886)

COMPUTER ADVISOR KUWAIT GULF

The Kuwait fund for Arab economic development seeks a Computer Advisor for a two-year contract. The position demands a mature professional with at least eight years' On-Line systems leadership and preferably with working knowledge of the Middle East.

The Computer Section is small and of high quality; it is intended that it should remain so. A twin CPU Tandem installation is in operation. The successful candidate will help to accelerate the professional development of this team.

Responsibilities will include—Detailed guidance in establishing on-line design concepts.

—Leadership of systems software function.

—Demonstrated record of on-line technical leadership, (Emphasis T.P., monitor and database.)

—Two years' systems experience in a financial institution, (Emphasis data security and audit.)

—Recent working experience of Tandem systems, (Emphasis Guardian, Pathway, Escribe and Enform.)

Salary (tax free) and benefits will be substantial. Initial interviews will be in the first half of April. Résumés in confidence to Box No. 1134.

ICL SYSTEM TEN ANALYST/PROGRAMMER

EASTBOURNE

We are an expanding publishing company, a subsidiary of CBS Inc. of America. We now wish to improve the on-line processing characteristics of our systems and require an Analyst/Programmer with at least two years' Assembler experience, preferably on System Ten. Our installation comprises twin system Ten 120 processors each with 16Mbytes, Model 44 disc drives plus 12 VDU's. The main applications are Order Entry, Sales Ledger, Bought Ledger, Nominal, Stock Control, Sales Analysis, Sales Ledger, Bought Ledger, Nominal, Stock Control. This vacancy presents an opportunity for a person with the right experience to expand their technical skills. The company's growth is such that we are likely to outgrow our present installation in 2-3 years. Thus the successful applicant will also form part of the management in future systems development, taking account of the latest developments in computer hardware. Salary commensurate with experience.

Please apply with CV to: S. Morrison, DP Manager, quoting ref. no. CW/181.

holt-saunders ltd publishers
181 Anne's Road, Eastbourne, Sussex BN21 2UN
Telephone: 0323 638221

(4886)

DATA PROCESSING MANAGER

HEXHAM, NORTHUMBERLAND

SALARY £27500 + CAR

Espagna International Ltd. is a successful, nationally established company marketing a worldwide range of exclusive imported software. We are looking for a Data Processing Manager to take responsibility for CMC Reality operations and systems programming. Candidates should preferably have management experience and be able to plan facilities to meet company systems development objectives.

The remuneration package includes four weeks annual holiday, pension and life assurance schemes, membership of BUPA (including dependents) and substantial accident insurance coverage.

This position is open to men and women with preference being given to those with experience of 'Reality' systems.

For an application form telephone Mrs. I. Robertson (0434) 604021 or write to Andrew M. Robertson, Managing Director, Espagna International Ltd., 17 Priestpople, Hexham, Northumberland.

(4886)

CONSULTING ENGINEER MATHEMATICIAN/ ENGINEER

As Systems Analyst for computer group developing and supporting advanced applications packages in computer terminal design, environmental engineering, in-house computer and graphics work stations are available.

An interest in mathematics or engineering, some experience of Fortran is required. Although based at St. Albans the successful applicant will also be responsible for the commissioning of custom built computer packages restoring periods of working at clients' computer installations. The ability to liaise with the client on behalf of the firm is a necessary qualification. A salary in the order of £20,000 per annum is offered and the position has excellent prospects.

Written applications in the form of C.V.'s or request for further details to: Mr. G. Thompson, IPC Electronic Systems Division, 20th Floor, Holborn, The Quadrant, London WC1R 8AS. Telephone No. 01-581 5151.

(4886)

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Upper Marlow Road,
St. Albans, Herts AL1 5UT
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ADVERTISEMENT MANAGER
FOR NEW BUSINESS
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Michael Page Partnership
Recruitment Consultants
London, Birmingham, Manchester

(4886)

IBM
London & Home Counties

Acting for a number of clients (IBM users), we seek Systems Analysts and Programmers with upwards of two years' experience, including IBM hardware/software. We would also be glad to assist candidates who wish to acquire knowledge of IBM systems. Current openings include:

SYSTEMS ANALYST (E. London)

to £11,250

Requirement: Upwards of six years' analysis experience, including supervision, plus drive and enthusiasm. Excellent promotion prospects in a growth situation. (Ref. 371)

SYSTEMS ANALYSTS (C. London)

to £8,500

Requirement: Around three years' commercial analysis experience plus ability to lead team of up to six, developing new systems. (Ref. 318)

SUPPORT PROGRAMMERS (W. London & Coventry)

to £10,500

Requirement: At least two years' programming, inc. COBOL, PL/I or Assembler. Previous support experience valuable, opportunity to use or learn database techniques. (Ref. 416)

FORTRAN PROGRAMMERS (C. London)

to £10,000

Requirement: Solid FORTRAN, ideally in a chemical or mechanical engineering environment. Degree preferred, modelling experience valuable. Chance to learn other languages, including COBOL. (Ref. 392)

If none of the above opportunities matches your career objectives and experience, you will find it advantageous to contact us as we are dealing with a wide variety of unadvertised posts, and will gladly assist you with your career development. Please ring us for a confidential discussion, quoting the appropriate reference. (Ref. 370)

(4886)

EDP SYSTEMS 01-637 5796
52-53 Margaret St. London W1N 7FF

JBA

Insurance Consultants

to £16,000+car

London

This prestigious consultancy organisation wish to recruit Senior Insurance Professionals to assume responsibility for the supervision of turnkey projects and to carry out consultancy assignments in the insurance world. Appointees will be expected to have significant computerised systems experience in one or more of these business areas: Lloyd's broking, Lloyd's underwriting, re-insurance, direct insurance. In particular they are looking for technically accomplished individuals who have a thorough appreciation of project control techniques and feasibility studies, coupled with proven analytical skills. Consultants are given considerable commercial responsibility for the management of projects and opportunities to develop their business careers. An excellent salary supplemented by attractive fringe benefits.

Contact: Margaret Stevens

Systems Manager - Designate

c. £13,000

A small but expanding telecommunication systems house require a highly competent technician to take full responsibility for a Command and Control real-time project, with the client site being in French speaking North Africa. You will be working on Data General hardware, with the programming language being Fortran, and your main involvement is developing, installing, commissioning and supporting the total system. Experience in systems, comms, and applications software, are essential qualities. Candidates must be prepared to travel overseas though not for extensive periods.

Contact: Brian Postles

Communications Consultant

c. £11,000

An International Consultancy Organisation is expanding its development of their Videotex systems and wish to recruit a Consultant to take responsibility for the design and development of new projects. Candidates should have at least five years experience in the design of real-time commercial applications, backed by a reasonable spell programming similar systems. A PDP11 or VAX11 background in a communications environment would be preferable. Knowledge of FORTRAN X25, 3270, Packet/Message Switching would obviously be an advantage.

Contact: Jim Baker

Software Instructor - Mini Systems

£10,000

NW1

A leading name in the small business machine market is currently expanding its operations into the mini/micro field. An exciting new position has been created for a technical training professional, to develop and run training courses for sales personnel, end users and equipment dealers. You will also be involved from an analyst/programming point of view, on new packages yet to be developed, involving several years in analysis and commercial programming essential.

An excellent opportunity for an enthusiastic, out-going, well educated professional.

Contact: Brian Postles

Analyst/Programmers (BASIC + 2)

to £9,000

City

Our Client, an interesting and unusual financial organisation, is looking for experienced Programmers to join them at a time when they are installing two PDP11/70s. A minimum of two years experience of BASIC + or BASIC +2 language from a financial or commercial environment, together with a knowledge of commodities and DEC hardware would be a definite advantage. The ability to understand users and their problems is essential. Good salaries and generous benefits are offered to successful candidates.

Contact: Janet Chivers

Communications Programmers - Babbage

£8,000 - £9,000

London

Continuing expansion of our Client's international Videotex business has created opportunities for Babbage programmers in real-time and network systems. Applicants should have at least four years programming experience and be capable of tackling packet switching, colour and business graphics. In this fast moving and exciting field, possible overseas travel.

Contact: Jim Baker

Analyst/Programmers

£7 - £10,000

Cambridge

Due to the securing of major contracts this organisation, specialising in the development of advanced engineering software, is recruiting experienced Analyst/Programmers to join a newly formed development unit concerned with all aspects of the design of chemical plant.

Applicants should have a proven ability in Fortran preferably with a background in Mathematics or Engineering. Experience in computer graphics and/or database techniques would be of particular relevance.

Contact: David Handley

Communications Support

£8,000+

London

This is an excellent opportunity to join a worldwide organisation who are in the process of developing their well established communications network.

It is essential to have at least one year's experience in a communications environment using IBM 3270 and/or ICL 7/BL coupled with a good working knowledge of Packet Switching.

A degree or equivalent in Engineering or related subject, is mandatory. Career prospects and exceptional training facilities will be offered along with good financial rewards.

Contact: Janet Chivers

JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311

Computer Field Engineers, Test Engineers and Repair Technicians

MAKE THE MOST OF YOUR SKILLS AND JOIN SYSTEM INDUSTRIES!

FIND OUT MORE AT OUR INFORMAL EVENING INTERVIEWS TO BE HELD AT THE HOLIDAY INN, HEATHROW FROM MARCH 10-12

System Industries is one of the leading independent suppliers of minicomputer disk systems. We are a California-based public corporation with European headquarters in Woking, Surrey, and offices and agents throughout Europe.

As a direct result of our very fast growth, we are now recruiting extra staff to meet the support demands of our ever-expanding customer base.

We need:

- FIELD ENGINEERS to be responsible for installing and servicing our products throughout the whole of the UK with some occasional European travel. At least two years' experience in the maintenance of DEC or DG minicomputers with experience on Disk, Tape and Memory Sub-systems a distinct advantage.

- TEST TECHNICIANS to be responsible for final testing of computer disk systems at our newly created testing facilities. Experience on exchangeable or fixed media high capacity disk drives preferable.

- REPAIR TECHNICIANS who will have gained a good grounding in digital and analogue techniques. Knowledge of high capacity disk drives preferable.

The company, an equal opportunity employer, offers an excellent remuneration package with extensive fringe benefits including profit related bonus plan, stock purchase plan, contributory pension scheme with free life, accident, BUPA and sick pay insurance, four weeks annual holiday entitlement with three months paid sabbatical leave in the seventh year and for all Field Engineers, a company car will be provided.

For an appointment please ring Norma Johnson on Woking (048 62) 5077

System Industries

System Industries (Europe) System House, Guildford Road, Woking, Surrey GU22 7QQ

(4328)

Software Professionals

Real-time command and control systems

Surrey up to £10,000

- A high level of personal responsibility in a congenial, professional environment.
- Stimulating work in multi-disciplinary teams involved in a variety of projects.
- Considerable room for career progress; ability, initiative and achievement recognised and rewarded.

The range of work at Plessey Radar is as varied and exciting as in any systems business in the world. Activities include real-time data processing systems for air traffic control; meteorological and environmental monitoring and control systems etc.

We want to find a limited number of Software Specialists with some background in implementing real-time command and control systems. Experience of the PDP11 and VAX11 range of computers is desirable but not essential.

Attractive salaries will be offered in line with experience and substantial relocation expenses will be paid where relevant.

So, if you want a bigger job with a professional team, ring or write to Peter Stein, Recruitment Manager, Plessey Radar, Addlestone, Weybridge, Surrey, Tel: Weybridge (0932) 47282.

PLESSEY
electronic systems

Systems Programmer

Apply your ICL 2900 knowledge to a new challenge

The work of the Computer Services Department at BNOC in Glasgow is demanding and varied.

Now, BNOC and ICL have joined forces in a new and challenging venture to develop oil industry software using an ICL Distributed Array Processor (DAP), the first to be installed in a commercial setting.

Initially concerned with reservoir simulation software, the project is seen as a unique opportunity to develop parallel processing techniques.

As an integral part of the 2900/DAP team an ICL 2900 VME/B systems specialist is required who has up to three years experience on VME/B and is familiar with its current development.

The salary/benefits package, including generous assistance with any relocation, is structured to attract people of exceptional abilities.

For details and application form, which should reach us by 2 April, please write or telephone quoting ref KM/CW to Ken Merchant, Divisional Personnel Officer, The British National Oil Corporation, 150 St. Vincent Street, Glasgow G2 5LJ. Tel (0141) 226 5555.

BNOC

Share in a better Britain

IMPERIAL COLLEGE

Blackett Laboratory
Research into
Electronic
Properties
of Solids

The Department of Physics of Imperial College has a vacancy in the Solid State Theory Group arising through expansion of the group's interests in the electronic properties of solids and their surface research which involves considerable scientific computing. The successful candidate will be expected to take an active part in development of computer codes in collaboration with members of the group, and would be responsible for maintaining and updating general availability of the codes required by the group and its research students. Applications are invited for applicants who could make a valuable contribution to the research of the group, and who have a PhD in his field of interest, recent, though other applicants, particularly those with a background in computing, would be considered.

Salary will be at a point on the academic-related IA scale c. £7000-£11,500.

For further information contact the Professor of Effect of Solid State Theory, Dept. of Physics, University of Daresbury, Warrington, WA4 4AD. Telephone 0226-65600, Ext. 224. Applications and names of two referees to this address by 31st March, 1981.

(4338)

User Interface Programming

The Computing Division provides a service for researchers sponsored by the SRC in universities, polytechnics and its own laboratories. The major computing power is provided by two IBM 3035's and an IBM 3032 linked together and accessed from works stations and interactive systems (mainly PRIME and GEC) connected to the SRC network.

Vacancies exist in the User Interface Group for PROGRAMMERS and a PROGRAM LIBRARIAN.

The programming team is responsible for liaising with users of the central computing service, offering advice and guidance with problems, documentation, implementing utilities and some involvement with developments of the service. Experience with IBM systems is required.

The Program Librarian will be responsible for general purpose program libraries which include standard supplied software used on a range of computers and locally developed software for particular machines. Some knowledge of numerical techniques and the portability of software is required. The person appointed will spend some of the time in general advisory duties.

A good knowledge of FORTRAN and the ability to produce meaningful documentation are required for these posts. Successful applicants should already have some experience as users of a Computing Service. A knowledge of any VM/CMS, OS/MVT, MVS, Graphics, Assembler, IV/1, IX/1, would be an advantage. Applicants should have a degree in computing or some related subject.

SALARY: Higher Scientific Officer - £6075 to £7900
or Scientific Officer - £4809 to £6480.

Appointment to a salary scale point above the minimum may be considered for candidates with good qualifications and particularly relevant experience/specialist training.

The Laboratories are a friendly community with their own restaurant and sports facilities nearby. We offer excellent working conditions, and benefits include a local transport service, generous holidays, sick leave allowance and a non-contributory superannuation scheme.

For an application form please write to: Mrs Elizabeth Fry Personnel Group, Rutherford & Appleton Laboratories, Chilton, Didcot, Oxon OX11 0QX, quoting reference: VN930. CLOSING DATE: 3rd April, 1981.

Rutherford and Appleton Laboratories

SYSTEMS ANALYST

Manager-delegate

SALARY NEGOTIABLE UP TO £11,000

THE COMPANY

National Public Company, turnover around £20M, profit based on its services in clearing supplies and other disciplines.

JOB BASED IN MONDON — The company initially wants to buy further finance and accounting procedures.

It is also interested in taking over the accounts of a small firm with no internal D/T department so this is a "conversion" situation.

JOB OBJECTIVES

1. To supervise the installation of the PDP 11/44 machine and auxiliary equipment, and links with hardware and software suppliers.

2. To analyse current financial control systems and co-operate with the department's manager to evaluate them.

3. To convert existing systems to more effective, faster and more economic systems.

4. Thereafter TO MANAGE THE COMPUTER DEPARTMENT, monitor its performance, advise on its development and write the business reports.

THE PERSON

1. Age 28-35. Novice required with over commuting distance of MONDON.

2. Good communication skills, both written and verbal.

3. Must have had formal training in D/T systems, including accounting and financial systems.

4. Must have not less than three years' experience of systems analysis, covering the use of D/T systems in the job objectives.

INTERESTED?

Then call Douglas Stephens at Great Dunmow (0371) 3066, 10 A.M.-2 P.M., 2nd and 3rd Thursdays, or Great Dunmow 2345, every evening 7-9 p.m., for a chat about this vacancy. Otherwise write to Great Dunmow 2345.

DBA APPOINTMENTS, 12A Buntingford Road, Dunmow, Essex CM9 1AA.

All replies will be acknowledged and no information of any kind will be passed on to any individual or company without prior permission given by the company concerned.

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100 St. Edmunds, Edgbaston, Birmingham B25 8JU. Tel: 021-225 6264. 24hr. answering service.

MYRIAD

SENIOR SYSTEMS ENGINEERS

OFFICE SYSTEMS FOR THE EIGHTIES

£10,000-£13,000

The Group has a major development plan which, in conjunction with the existing products, will enable the company to make a major impact upon the Office Systems market of the next decade.

NORTH WILTS

We are seeking enthusiastic and well-motivated senior engineers to join a specialist group which has responsibility for the evaluation, definition and development co-ordination of advanced systems for Telecommunications and Information Processing.

The successful candidates will offer a proven background in systems development including substantial experience of one, or more, of the following areas:

★ Hardware development of digital electronics in communications and computer interfacing

★ Digital systems simulation for modelling future business systems

★ Software for computer communications and filing systems, editors, etc.

★ CCITT standards and protocols for digital information exchange

Engineers will be educated to degree level, be prepared and able to take a total system approach, and be sufficiently experienced in one or more of the above fields to take a given project to completion.

These positions offer excellent scope for technical originality in a demanding and exciting field. Conditions of employment are excellent and include comprehensive relocation expenses where appropriate. To discuss the scope of these opportunities in detail and arrange an interview either telephone Myriad on the number below or write quoting reference

RN3/1903/CW.

TELECOMMUNICATIONS SOFTWARE DESIGNERS

WILTSHIRE £ NEGOTIABLE

One of the market leaders in the field of telephony systems, our client is seeking additional Senior Software Designers/Programmers who will play a major role in the development of the new generation of fully digital telephone switching systems.

The successful candidates will offer experience of:

★ Telephony software development

★ Mini and micro systems

★ High-level languages (CHILL/PASCAL/CORAL)

The company offers excellent conditions of employment including high base salaries and relocation expenses where appropriate. To discuss the organisation and these positions in detail telephone Myriad on the number below. Alternatively write, quoting reference

RN4/1903/CW.

BUILD A DEC NETWORK

UXBRIDGE £9-£10½K

A recently-installed PDP 11/70 forms the heart of a distributed processing network that will support twelve remote sites, thereby providing advanced interactive systems for local users.

The Software Group is now seeking to expand its team of specialists by recruiting a TECHNICAL PROGRAMMER with RSTS/E operating system experience. BASIC + 2 knowledge is highly desirable but applicants with a sound hardware and telecommunications background will be equally considered, as the Group is currently tuning and further developing the network.

★ RSTS/E

★ REMOTE TERMINALS

★ TELECOMS SYSTEMS

★ REAL-TIME SOFTWARE

★ RMS/FMS TRAINING

★ BASIC + 2

The Company is proud of its international reputation as an employer offering a secure and positive future along with a first-class benefits package, including relocation expenses where appropriate.

REF: S1/1903

Project Leaders — Analyst/Programmers

Your future could be here.

Our clients, based in the West of Scotland, are part a multi-national concern with expanding interests. A major share of the UK market and increasing export figures have led to high profitability, stability and a work force totally unaffected by the current recession.

An Analyst should possess a degree in the physical sciences and/or a honours degree in a discipline such as Mathematics, Physics, Chemistry, Economics, etc. An interest in computers and a desire to learn about them is essential.

The successful candidate will be required to work closely with the Project Leader and other analysts and programmers. Duties will include system analysis, design and specification, and preparation of detailed designs and programs.

Responsibilities will include involvement in high level systems and database design as well as travel to European installations. The position is available immediately April 1981. Please send resume to:

Harrison Cowley Executive Selection

100 St. Edmunds, Edgbaston, Birmingham B25 8JU. Tel: 021-225 6264. 24hr. answering service.

All replies will be acknowledged and no information of any kind will be passed on to any individual or company without prior permission given by the company concerned.

MYRIAD APPOINTMENTS LIMITED

30 Fleet Street, London EC4Y 1AA Telephone 01 351 0981 24 hours

Opportunities in Systems Programming ICL 2900/Univac 1100

LONDON up to £11,497

We are looking for Senior Systems Programmers/Systems Programmers to join the Technical Support Group of our Computer Services Department. This Group is responsible for all aspects of systems support on the Department's mainframe computer systems [currently ICL 2972 and Univac 1100/2] which provide a bureau service to British Gas HQ Departments.

This work involves the implementation, maintenance and development of all systems software [future TP work is envisaged], the design and production of special software and utilities as required, and the provision of a support function to the Operations Group and all users of the bureau service.

The Department is also active in office automation, microcomputing, specialist computing, computers and database projects - there could be scope for your future involvement in these development activities.

Ideally, you should have some experience in systems support, or a sound technical and working knowledge of large computer systems. A good degree would be an advantage. Experienced Applications Programmers who would like to make a career change into systems work will also be considered.

The Department is situated on the borders of Fulham and Chelsea - work is organised on a project basis, and there is every encouragement for personal initiative.

For further information on the openings available please ring John Yonge on 01-736 3344 Ext. 290. Starting salary will depend on qualifications and experience but will be within the range £8,668 to £11,497. The benefits are those normally associated with a large progressive organisation. Ref. EP/763904/CW.

BRITISH GAS

CAREERS IN THE U.S.A. NOT INTERESTED IN NEW YORK?

Well, to a degree, we don't blame you. Our clients prefer a rural area too. That's why they have relocated to rural Long Island; close to the sea, within easy reach of the countryside, yet only 50 minutes from the facilities of the City.

We can now offer interesting jobs at all levels to those with over 2 years' sound experience in COBOL with MVS/OS/DOS/VS/CICS.

Remember, these positions are as permanent as YOU make them and, with us, you know where you are going. We also offer very good salaries, superb medical coverage and a comprehensive relocation package for you and your family.

Interested? Send your CV or call Lloyd Williams at Computer Two Thousand.

STOP PRESS: We are still interviewing for FLORIDA and CALIFORNIA so, if you would like to stop by for an informal chat, call in at the New Berners Hotel, Berners Street, W.1 and ask for Bob Collett.

TALK TO OCC: We are still interviewing for FLORIDA and CALIFORNIA so, if you would like to stop by for an informal chat, call in at the New Berners Hotel, Berners Street, W.1 and ask for Bob Collett.

For further information on the openings available please ring John Yonge on 01-736 3344 Ext. 290. Starting salary will depend on qualifications and experience but will be within the range £8,668 to £11,497. The benefits are those normally associated with a large progressive organisation. Ref. EP/763904/CW.



When you finish hunting

Talk to OCC about salaries up to £22,000 p.a. after tax with the world's largest oil producer

You must have wondered about the Middle East. You will certainly have seen plenty of ads and heard a few stories about life out there. Why not get the facts? They are well worth hearing. At the Gloucester Hotel on Monday, 23 March we'll be offering coffee, answering your questions in detail, and showing a few slides. We'll introduce you to people with recent first-hand experience of life in Saudi Arabia.

If you hold one of the following positions, we look forward to talking to you. It would be the best move you'll ever make.

Office Systems Analysts **Business Systems Analysts**
Systems Analysts **EDP Trainers**
EDP Planners **Standards Writers**
Transport Data **Systems Analysts with Hewlett-Packard experience**
Systems Advisers **Contracts Analysts**
Systems Designers

Applications experience could be wide ranging, but machine experience should have been on large IBM systems. A degree, HND or equivalent qualification is essential.

Benefits package includes

- Salaries up to £22,000 after tax
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ESSEX to £10,000

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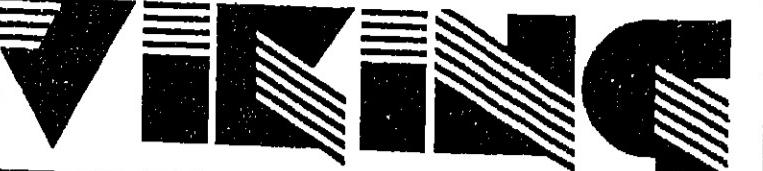
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This industrial organisation is soon to install an IBM 4331 to develop a variety of on-line applications. Applicants should possess a minimum of 12 months COBOL experience and a sound knowledge of CICS.

Analysts, Tech. Support Programmer

ESSEX to £11,500

This electronics company, engaged in Production Control application, seeks additional personnel for its Hewlett Packard installation. Analysts must have a Cobol background and 2 years' systems experience, whilst the Technical Support Programmer must have 5 years' Cobol and preferably a knowledge of R.P. hardware.



IBM Analysts & Programmers

Salary range £7,500 to £12,000

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All positions offer an attractive remuneration package with excellent opportunities for career advancement.

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£12,000 +car
 This U.K. giant of the entertainment business is currently seeking a Manager to oversee the research and development of a large scale point-of-sale implementation.

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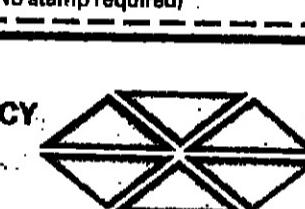
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World-wide organisation, specialising in the development, support and marketing of IBM system software requires professional people for EUROPE and AUSTRALIA.

Systems Engineers must have experience in OS and/or DOS operating systems, whilst Sales people must have a track record in selling computer-related products.

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This is an opportunity to contribute to a most exciting and rapidly growing environment, and candidates should already have a substantial experience. Knowledge of Hewlett Packard Software would be an advantage although necessary training will be provided. The predominant programming language is COBOL.

In addition to an attractive starting salary our first class benefits package is what you would expect from one of the most progressive British companies.

Montrose is a thriving, coastal market town within easy reach of Dundee and Aberdeen and surrounded by some of the most delightful scenery in the country.

It is a good place to earn a living; an even better place to live.

Please write or telephone for an application form, quoting reference 185, to: Mr. M. Ryan, Personnel Department, Glaxo Operations UK Ltd, Cobden Street, Montrose DD10 8EB. Tel: (0674) Montrose 2608.



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Please continue on separate sheet of paper if necessary, or send us your curriculum vitae.

I understand that the above details will be treated in the strictest confidence, and no action will be taken without my consent.

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East Anglian Regional Health Authority
Computer Division

Systems Designer/ Programmer

Salary within the scale £8,312 to £7,895 – depending on qualifications and experience.

Applications are invited from systems designers and programmers with at least two years' experience, to work on a variety of financial applications for the Health Authorities in East Anglia. Some programming for an ICL mainframe is required but the main thrust of present development work is on VENTEK DATAPoint minicomputers and experience with these computers will be particularly beneficial.

Further details and application forms are obtainable from the Regional Personnel Office, East Anglian RHA, Union Lane, Cambridge CB4 1RF (Tel: 01-222 3251) Closing date: 6 April, 1981.

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Salary

£25,000 p.a.

We are looking for a DMS specialist to work as a consultant in West Germany, either full-time or for a contractual period of no less than two years. The successful candidate will be working with a highly qualified team of international specialists on one of the largest U1100 Systems in Europe. The remuneration will be over £2,000 per month.

The candidate should have at least 7-10 years of experience with IMS, both on the Systems and on the Application side and should be willing to learn German, although all the potential working colleagues master the English language.

Applications to Computer Weekly, Box 1132.

BOX NUMBERS

Box number replies should be addressed to:

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The Quadrant,
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Application form may be obtained from the Registrar, Stevenson College of Further Education, Bankhead Avenue, Sighthill, Edinburgh EH11 4QE.
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A Team leader within our Computer Services department is to be appointed to be directly responsible for the computer support of our International Conventions Department. This department deals with the statutory safety requirements for ships, and the work is therefore likely to involve development and support of advanced techniques in the following areas:-

Modern and Classical Stability Theory • Simulation (Discrete and Continuous CAD Applications • Hydrodynamics • Numerical Analysis

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Experience – a minimum of two years' experience is desirable together with a knowledge of the George 3 or VME/3 operating systems.

Location: Town Hall, Bromley, Kent. Tel. 01-484 3333, Ext. 311. Closing date 31st March, 1981.

Please write, giving full details, to the Recruitment and Staff Relations Officer (marking the envelope 'Confidential').

(4848)

Lloyd's Register of Shipping
71 Fenchurch Street, London EC3M 4BS

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Analyst/Programmer

LONDON up to £10,653

We are looking for an Analyst/Programmer to join the Database Section of our Computer Services Department. This Section designs and prototypes information systems for both technical and commercial application areas; provides a database management function and serves as a consultant within British Gas.

A varied programming environment is available based on Univac 1100/21, and ICL 2972 hardware. Conventional high level languages of COBOL and FORTRAN are extended by means of Cadat (Univac DMS 1100, ICL IDMS) database and interactive Query languages to meet the needs of individual problem areas.

We welcome applications from candidates with a degree in a numerate subject together with practical experience of developing systems using FORTRAN or COBOL within a large operating system environment. Experience of database software is not essential, but is desirable.

Starting salary will depend on qualifications and experience but will be within the range of £8,668 to £10,653. The benefits are those normally associated with a large progressive organisation.

Please write, quoting ref. EP/764001/CW, giving full details of age, qualifications and experience, to: Senior Personnel Officer [London], British Gas, 59 Bryerton Street, London W1A 2AZ.

BRITISH GAS

£25,000 p.a.

We are looking for a DMS specialist to work as a consultant in West Germany, either full-time or for a contractual period of no less than two years. The successful candidate will be working with a highly qualified team of international specialists on one of the largest U1100 Systems in Europe. The remuneration will be over £2,000 per month.

The candidate should have at least 7-10 years of experience with IMS, both on the Systems and on the Application side and should be willing to learn German, although all the potential working colleagues master the English language.

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APPLICATION PROGRAMMER

ICL COBOL Analysts and Programmers are required by an impressive insurance company in Bury St Edmunds. Analysts will be involved in financial applications, primarily dealing with insurance claims and policy administration. Previous experience would be advantageous.

LONDON

A major manufacturing company in North London requires DEC PDP11 programmers. If you have a minimum of two years' experience in COBOL, PL/I or FORTRAN, and are interested in an industrial application area, or who have a knowledge of ICL/1803 or ICL/2800 under RS/1803 or RS/2800, the company has a good offer. We are looking for a substantial number of staff, and the possibility of relocation and career progression.

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An opportunity has arisen for young programmers with a minimum of 8-12 months' experience in BASIC + 2-DIMENSIONAL PL/1. You will be required to develop sales accounting Systems and other financial applications. Good basic PL/1 knowledge would be an advantage. Call: Mary on 01-836 8411. Ref. MC109/CW.

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10 Lines

MIDLANDS RECRUITMENT ADVERTISING FEATURE

A lower cost of living – and scope for development

THE Midlands is certainly not one of the UK's glamour areas, but there are good reasons for living and working there. Vic Sheret has been interviewing four Midlandophiles to find out why...

MS G. SHERIDAN of Sherrill Communications.

Q. What do you consider to be the benefits of working and living in the Midlands? A. Obviously, the lower cost of living is one of the main advantages, especially when buying a house and comparing prices with those in the South. There is scope for small businesses to expand, and generally a good environment for development. Being a central location, there is the opportunity to travel freely to most parts of Britain. It is also notable that people in the Midlands have a very favourable attitude towards business women and are prepared to accept any person capable of doing the work well, irrespective of sex.

Q. How is the recession affecting the Midlands?

A. There is no disputing that it is very bad, but there are opportunities in many areas within the computer industry, especially contract work. In general, companies

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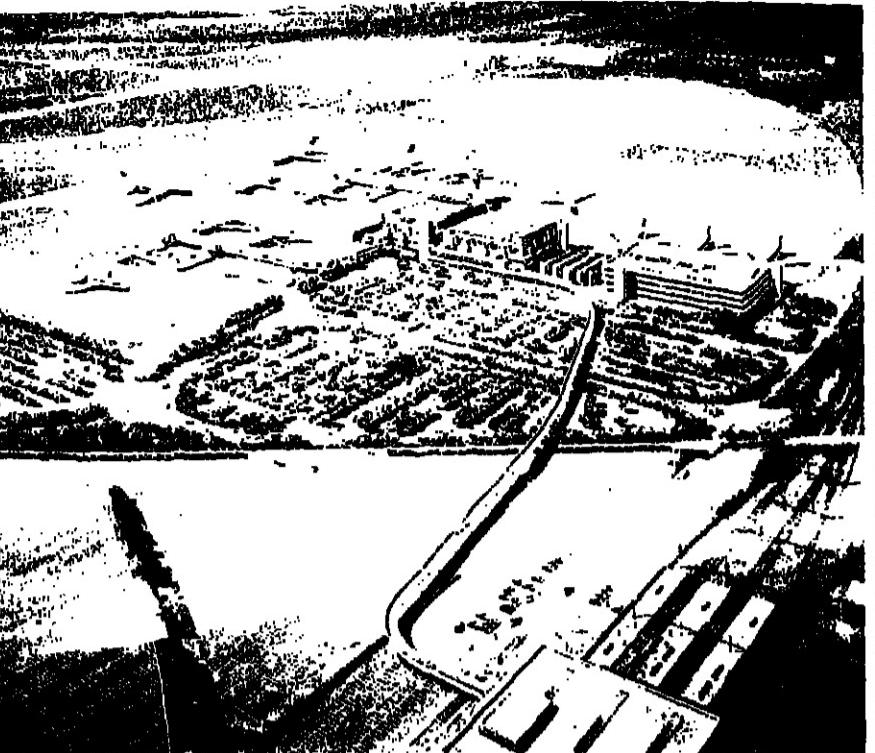
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Tel (Day) _____

(Evening) _____

Mail (no stamp) to FREEPOST Computer People
Midlands, Alpha Tower, Birmingham B1 1EB

Computer People Midlands
GPO Box 7002



A much-needed boost to the economic life of the West Midlands should be provided when Birmingham's new airport opens in 1984. The new terminal, pictured above, will eventually cater for nearly 3 million passengers a year and will have a magnetic levitation rail link between it and the Birmingham International railway station and nearby National Exhibition Centre.

are looking hard at their finances and they have stopped investing and recruiting. Where this means there are fewer jobs available in the Midlands, the quality of the vacancies on offer remains very high. Summarising the situation in the Midlands, it is certainly no worse than elsewhere in the country.

Q. It is the International Year of the Disabled. Do you feel there are sufficient facilities for the disabled within the computer industry in the Midlands?

A. Nearly all companies are conscious of the fact that disabled people have much to offer, particularly in programming. There are many special aids available to assist the disabled, and again, we can highlight the programming side. However, companies are aware of the need to do more for the disabled, but there are many obstacles that have yet to be overcome.

□ □ □

MR B. STEVENS of James Baker Associates.

Q. How do you see the quality of staff in the Midlands? A. At present, it appears difficult for most companies to obtain quality. The vacancies advertised for the better qualified DP staff are much

harder to fill, whereas positions for trainees would attract a much better response.

Q. What opportunities are available for people trained on a TOPS course? A. The only hope I can offer to anyone having completed a TOPS course is that they approach a company willing to offer them a position as a trainee. Unfortunately, few companies are prepared to incur the expense of training inexperienced people and then lose them to larger companies on completion of training.

Q. What opportunity is there for advancement in the Midlands?

A. At present, there is very little opportunity for advancement because people are reluctant to change jobs due to the employment situations.

□ □ □

MR S. HEYWOOD of Coventry City Council.

Q. How do you see the quality of staff in the Midlands? A. At present, it appears difficult for most companies to obtain quality. The vacancies advertised for the better qualified DP staff are much

cause of the lower cost of living in the Midlands.

Q. How do you see the standard of equipment at present in use in the Midlands? A. We are most certainly not behind the times, and in some instances are ahead of the times, especially on sites and technology. Again there is very little difference when comparing the Midlands to any other area, although one does find a different emphasis in the Midlands and North where they tend to concentrate on manufacturing systems with less regard to the financial and banking aspects.

Q. To what extent are formal qualifications taken into

consideration when assessing applicants for jobs? A. There is an increasing emphasis on degree and HND/HNC qualifications, particularly for the lower grade positions but it is true to say that experience is still the overriding factor.

□ □ □

MR R. TOWNS of Austin Knight.

Q. How is the computer industry there? A. It is usual for companies to offer fringe benefits, but in reality what are these fringe benefits?

A. It would appear most companies have vacancies for programmers on the lower end of the scale and systems analysis seems to be a major problem area.

Q. To what extent are legal

expenses. Many will also give consideration to out-of-pocket expenses. It is usual to provide a car, but this depends on the level of the position, and the company concerned. The benefits offered by companies in the Midlands are equal to any in the country.

Q. Within the computer industry there are a variety of vacancies. What type of vacancy is predominantly available?

A. It would appear most companies have vacancies for programmers on the lower end of the scale and systems analysis seems to be a major problem area.

Q. To what extent are legal

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Q. Within the computer industry there are a variety of vacancies. What type of vacancy is predominantly available?

A. It would appear most companies have vacancies for programmers on the lower end of the scale and systems analysis seems to be a major problem area.

A company spokesman commented: "Reasonably priced housing is one of the biggest advantages, with a three-bedroom semi available from as little as £15,000. Communications with the rest of the country, and locally, are first-class and it is possible to live in some attractive locations in Nottinghamshire and Leicestershire, all within commuting distance of Birston."

Two part-time research assistants are needed to help with research in mathematical queuing theory and teletraffic analysis. The work will appeal to people interested in numerical analysis, mathematical software and simulation of discrete systems.

Applicants should preferably be qualified to honours degree standard in mathematics, computer science, statistics or other relevant subject.

The appointments will be for a period of up to three years and the salary will be payable pro-rata to the full-time scale £6,286 - £7,700 per annum.

Application forms and further particulars may be obtained from the Staff Officer (quoting Ref: 482/102), University of Aston in Birmingham, Gosforth Green, Birmingham B4 7ET. Tel: 021-368 2011, Ext. 201. Closing date for the receipt of applications is 10th April, 1981.

(4862)

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This position is to teach programming, improve the standard of programming and systems analysis at all levels and advise senior staff on new techniques. This could form the next step in the career development of a really good Analyst/Programmer or Programmer with IBM COBOL or ASSEMBLER experience.

Junior Project Management
We need junior managers to lead and develop teams in the following project areas: Production, Marketing and Research. In each case approximately 1/4 year experience is required.

Want to know more? Then write or telephone for a personal data form to Jim Hallinan, Employment (Commercial), The Boots Company Limited, Head Office, Beeston, Nottingham, NG9 3AA. Telephone Nottingham (0602) 561111, ext. 2321.

The above positions are open to both male and female applicants.

Proposals are being formulated for new projects relating to a campus network and database implementation. The experience offered should prove rewarding to the right candidates.

Application forms and further particulars available from: Staffing Officer, Leicester Polytechnic, PO Box 149, Leicester LE1 8BH. Tel: (0533) 661851, Ext. 2303/1.

(4863)

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This is a senior position within the Computer Operations Department and the job holder will be responsible to the Computer Operations Manager for the efficient utilisation of the Society's Honeywell level 84 computers.

The Society is currently developing on-line systems and plans to install over 160 terminals in branch offices during the next few years.

Applicants should have several years operating experience in a senior capacity within a multi-programming environment and be able to demonstrate a sound technical ability. Level 84 and communications experience would be an advantage.

We can offer an extremely attractive pay and benefits package.

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Challenging the climate of recession more dramatically than any comparable journal, Computer Weekly announces a major circulation increase - to 100,000 - breaking the six-figure barrier for the first time in the history of U.K. computer journals.

ComputerWeekly tops 100,000 circulation

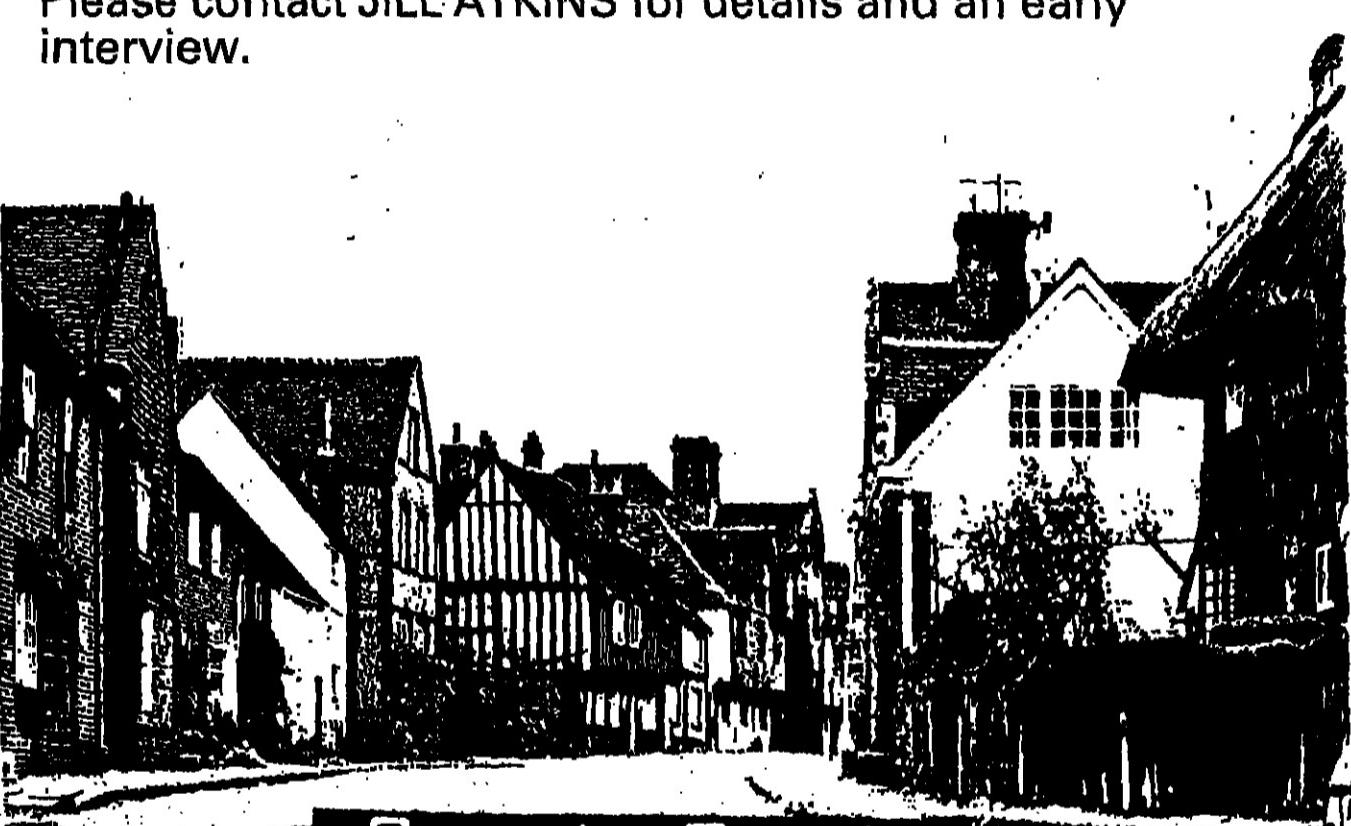
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KEY OPERATIONS ASSISTANCE LTD.

IBM OPERATIONS MANAGER £13,000+

A leading concern based in Central London currently require an individual with flair and initiative to advise on and implement a new organisational structure within their expanding computer installation. Currently based on large IBM 370 hardware, conversion to IBM 4341's with an IMS-Database facility is planned for mid '81. It is necessary for candidates to have already gained management experience in a customer orientated environment, possess excellent inter-personal communication skills and have had exposure to database usage, preferably IMS. This position provides an unequalled career opportunity to be involved in an international organisation with worldwide commitments. A comprehensive benefit package, which includes mortgage subsidy, is offered together with an excellent negotiable salary.

IBM SHIFT LEADER £19,700+

A progressive financial concern situated in Central London require a highly motivated individual to supervise the efficient running of a shift. The company rely heavily on their computer facilities to provide up-to-date information regarding worldwide delivery transactions and are therefore committed to keeping abreast of technical developments and maintaining a highly professional computer team.

Candidates must have a minimum of 4 years' IBM experience with a thorough knowledge of DOS/VIS, POWER/VIS, associated utilities and JCL, CICS and VTAM. In addition to the excellent salary, the company offer mortgage subsidy and life assurance. This position is worked on a two-shift system covering 07.30-22.30 Monday to Friday.

For more information on the above and other IBM vacancies - technical and management - please ring JANET WARREN. All enquiries are treated confidentially.

KEY OPERATIONS ASSISTANCE LIMITED
29 NEW STREET, LONDON, W.I. 01-409 7851

PROJECT LEADER

HANTS

TO £12,000

- ★ Exp. Project Leader or Outstanding Analyst/Programmer
- ★ Lead teams of up to 6 computer professionals
- ★ 3/4 years' PDP11 RSX 11M using MACRO 11
- ★ Big user environment or software house exp.

Our client's business is the creative use of advanced electronics to solve industrial problems across a wide range of industries. They can promise you a constant challenge to your technical skills and innovative abilities. You will have difficulty staying in the same project for long! Progression is important to this company.

Please contact JILL ATKINS for details and an early interview.

datascene

PROJECT LEADER ICL 2904

CITY

Our clients are a leading member of the London commodity market who seek an enthusiastic project leader for their ICL installation.

Candidates, who will lead a small team, should be aged about 30, have a programming and analysis background and have successfully completed 1 or 2 projects, from design through to implementations.

Some U.K. travel is involved and the accent is on enthusiasm.

In addition to an excellent salary, the company offers a non-contributory pension scheme, free BUPA, D.311

to £10,000

LONDON

As a result of continued expansion, a very successful trading company on the fringe of the city urgently require still more PL/I programmers.

Candidates should have a minimum of 2 years' PL/I programming, which has been gained in a team environment with involvement in at least one medium system. IBM Cobol programmers may also apply.

Apart from the salary the company offers good chances for promotion and numerous benefits, befitting an organisation of their reputation.

D.804

c. £8,000

Outstanding opportunities have arisen for candidates to join a long-established and successful company. You should be aged 18-34 years and educated to at least degree level. It is essential that all applicants possess good personal communication skills and demonstrate the ability to solve problems both quickly and professionally. Of particular interest

JNR. ANALYST/PROGRAMMERS
IBM 4341

LONDON

Openings exist within a leading oil company for junior analysts/programmers who can show a successful career path within the computer industry together with a good educational record.

Their requirement for at least one year's commercial COBOL programming on IBM 370 or 4300 machinery together with at least good 'A' levels or, preferably, a degree.

In return they offer a definite career structure with ample training facilities, and the very best in company benefits and working conditions.

D.8027

PROGRAMMER/ANALYST
RPG II

LONDON, CITY

An excellent opportunity has arisen for a Programmer/analyst who would like more involvement with systems design. The company they will be working for are totally involved in banking and are American owned.

Ideally you should have between 2-4 years' RPGII Programming experience and a good theoretical knowledge of system design. A good knowledge of banking applications is also required.

The company offer an excellent career path coupled with regular training courses and benefits including subsidised restaurant, sports and social club and mortgage facilities at well below building society rates.

To c. £8,500

RPG II PROGRAMMERS
LONDON, H. COUNTIES

LONDON/CITY

DataScene have recently taken a considerable number of vacancies for RPG II Programmers in London and the Home Counties.

The range of industries within the client database are wide ranging but include Petrochemical, Banking, Insurance, Engineering and Software houses.

Ideally you should have at least one year's experience but preferably 18 months' together with a good standard of education.

Progression within the various departments is good as all companies offer career progression.

M.GEN

BASIC, BASIC +
PROGRAMMERS

LONDON/CITY

We are in contract with a number of Banks who are seeking programmers with upwards of eighteen months' experience in business BASIC, BASIC +, BASIC +2, or AIM5. Successful applicants can expect to be working in a batch and real-time environment on applications such as foreign exchange and eurobonds. Opportunities for career progression are excellent and the employment packages offered include interest free season ticket loans, productivity bonus schemes, staff restaurant/luncheon vouchers and low interest mortgage facilities.

R.GEN 2

ANALYST/PROGRAMMERS
& PROGRAMMERS

S.W. LONDON

A leading manufacturing company require an experienced Senior Analyst/Programmer, one Analyst/Programmer and one Programmer to complete their existing team. Experience required ranges from 2/5 years' on-line working with COBOL. A sound knowledge of commercial application and project management will be advantageous to those applicants applying for the senior positions offered. The company benefits include five weeks' holiday, product discount, subsidised canteen and Pension Scheme after one year's employment.

R.GEN 3

HEWLETT PACKARD 3000
COBOL

LONDON/HOME COUNTIES

We have several Hewlett Packard clients with current vacancies for experienced Analysts, Analyst/Programmers and Programmers. Experience required is from 1/2 years upwards on this equipment with a good knowledge of commercial or finance applications and a good standard of education. Progression within the various companies is excellent as all offer solid career growth. A wide range of company benefits are offered and represent fine opportunities for suitable qualified applicants.

R.GEN 1

The above vacancies are only a small selection from those currently on our files and we are always delighted to talk to experienced systems and programming staff wishing to further their careers.

R.GEN 2

datascene International Limited
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London W1. Tel: 01-439 7871

01-439 7871
24 hour answer phone

Recruitment  In Informatics

Communications Software

Southern Germany: Salary to £15K

Communications Engineers from Programme/Analysts to Team Leader level are urgently required by a leading Systems Development Company. Applications involving Systems Development, particularly in the design and construction of an advanced telephony system based on Intel 8086 microprocessors. All applicants must possess at least two years' real-time software development experience in any leading mini or micro-computer language such as PASCAL, CORAL or RTU-2. For the more senior positions it is also necessary to be fluent within an Assembler language and be capable of supervising a team of up to 10 programmers and Analysts. Initial interviews will be held in London and those who are successful will be invited to the Company's premises prior to offers of employment being made.

Ref. L/12/A.

Technical Consultants

Central London: Salaries to £15K

Outstanding opportunities have arisen for candidates to join a long-established and successful company. You should be aged 18-34 years and educated to at least degree level. It is essential that all applicants possess good personal communication skills and demonstrate the ability to solve problems both quickly and professionally. Of particular interest

Ref. L/12/B.

Technical & Commercial S/W

E.E.C.: Pkg. to £16K

Technical and Commercial Software Specialists are urgently sought by a leading Systems and Software House. Applicants with a minimum of 2 years' experience in Assembler, Basic or PL/I on small business interactive systems. Of special interest will be candidates with experience in distributed processing techniques. Technically-oriented applicants will be expected to have experience in communications, graphics, databases, message switching or Process Control Systems development. Ancillary benefits are excellent and successful applicants will be offered full relocation assistance.

Ref. L/12/C.

Commercial Programmers

Berks/Surrey: Salary to £8K

Commercial Applications Programmers with at least 2 years' experience are required to work in a small, profitable Systems and Software House. It is essential that all applicants are familiar with at least one high-level language, preferably Fortran, but those fluent in Cobol or other commercially orientated languages are encouraged to apply. Our clients have a strong preference for candidates who have a degree or equivalent. Previous hardware experience is not a major factor. These positions represent a rare opportunity for successful applicants to enhance their technical skills whilst working in an attractive rural setting.

Ref. L/12/D.

Snr. Systems Analysts

City: Salary to £12K

As a result of recently upgrading its installation, a leading City-based company has a number of vacancies for Senior Systems Analysts. Respondents will be expected to have participated in the development of at least one medium to large computer system, previously utilizing D.9C, Computer Database and Teleprocessing Software. Whilst not essential, it is desirable for candidates to have experience of cost benefit analysis in a commercial business environment. Successful applicants will be responsible for the supervision of a team of up to 5 Analysts and the ability to communicate in all areas as well as motivate staff are therefore prime requirements.

Ref. L/12/E.

Logistix, 10 Grenville Place London SW7 4RW

01-373 3063 Telex: 28800

Ref. L/12/F.

D.P. Consultants

Minicomputer Technology

Bushey, Herts.

£ high negotiable

DP Consultants, this is your opportunity to be involved at the heart of our exciting plan to link the various Rank Xerox companies throughout Europe by means of a network of distributed processing systems. We are utilising Honeywell Level 6 and DEC minicomputers to communicate with the large IBM mainframes in three International Data Centres at Bushey, Paris and Dusseldorf.

The Minicomputer Technology Group responsibility includes:

- Providing a consultancy service on the suitability of minicomputers for particular applications.
- Evaluation and selection of hardware and software.
- Support to users during and post implementation of minicomputer systems.
- Development, distribution and support of specialised communications interface software.

Applicants should have at least 4 years relevant experience as a minicomputer Support Specialist. Opportunities exist at both technical and supervisory level.

The salary and benefits package is excellent and includes company pension scheme, free life assurance, free BUPA, four weeks holiday - rising to five, generous education package and a subsidised staff restaurant.

Please write with career details or telephone for an application form to Ruth Kalinowicz, Rank Xerox Ltd., Phoenix House, Kemp Place, Bushey, Herts. Tel: 01-950 4030, Ext. 286.

RANK XEROX

IMS & Systems Support Specialists

Bushey, Herts

Rank Xerox provides centralised data processing through three International Data Centres located at Bushey, Paris and Dusseldorf. These act as a "service bureaux" to the various Rank Xerox companies throughout Europe by providing them with large IBM-mainframe computing facilities running MVS and JES3.

Our Customer Support Group, based at Bushey, provides an extensive range of technical services and support activities to all our users who are located in more than twenty sites in 12 European countries.

Due to continued expansion we can offer a number of challenging and interesting positions to experienced DP professionals wishing to utilize and extend their skills in a support environment.

Interactive Systems Support

This group is responsible for all systems programming work relating to database and data communications software. We are seeking individuals who have:

- sound knowledge of IMS DB/DC software and/or
- several years experience of developing IMS DB/DC applications.

Successful applicants will join the existing team and be expected to make a major contribution to the implementation of IMS DB/DC throughout Rank Xerox.

Batch Systems Support

This group is responsible for evaluating commercial utility software packages, providing technical support services to user sites and assisting users in planning and using the data security facilities (RACF). We are seeking individuals who have:

- a sound knowledge of using Assembler under an IBM/OS operating system preferably MVS
- some experience in IBM/OS operating system software
- knowledge of RACF and how it works (not essential)
- experience of using/installing vendor software
- some COBOL/high-level language experience.

Successful applicants will be expected to be self-motivating, able to work with a minimum of supervision and to make a significant contribution to the work of the group.

Applicants should have a minimum of 4 years' DP experience of which 2 years should have been in an IBM environment. The salary and benefits package is excellent and includes company pension scheme, free life insurance, free BUPA, four weeks holiday - rising to five, generous relocation package and subsidised staff restaurant.

Please write with career details or telephone for further information and an application form to Ruth Kalinowicz, Rank Xerox Ltd., Phoenix House, Kemp Place, Bushey, Herts. Tel: 01-950 4030 Ext. 286.

RANK XEROX

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CIRCA £12,500 PER ANNUM
PLUS: CAR - PROFIT SHARING - MORTGAGE SUBSIDY -
AND MANY OTHER FRINGE BENEFITS

An opportunity has arisen for a well-qualified computer professional to join a subsidiary of a major International Financial Group as Data Processing Manager.

Ideally you will portray the following levels of experience and skill:
 1. A sound D.P. background having developed your career from Programming through Systems Analysis and Design and currently occupying a responsible management position.
 2. You will have experience of working with sophisticated On-line/Real Time systems preferably related to financially based applications.
 3. Familiarity with more than one level of computer mainframe, with particular experience based upon PDP 11/70 hardware will prove highly attractive.
 4. We would expect you to be experienced in managing D.P. personnel at all levels and to portray the ability to communicate well with user personnel and departments.

THIS IS AN OUTSTANDING OPPORTUNITY FOR A PERSON TO JOIN A FORWARD-LOOKING AND EXPANDING COMPANY INTERESTED IN TAKING ADVANTAGE OF NEW D.P. TECHNOLOGY AND WISH TO MAKE THIS NEW APPOINTMENT BY THE END OF MARCH AND THEREFORE RING US (24-HOUR ANSWERING SERVICE) OR SEND YOUR C.V. NOW WITH A VIEW TO ARRANGING AN EARLY REF: CW/8/81

INBUCON MANAGEMENT CONSULTANTS LIMITED
D.P. Appointments & Contract Personnel
Greenock House, 19 Cuckfield Road, Hurstbridge,
Surrey SM6 9RP. Telephone: Hurstbridge (0273) 833848

INBUCON

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A Sales and Marketing Services Company
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Sell in Europe!

This is a rare opportunity for successful senior sales people who are attracted by the stimulation, challenge and career advancement of a move into international selling.

We have been retained by a specialist division within a major international computer manufacturer to locate a top-flight sales person for the role of

Manager of Distributor Sales (Europe)

This will involve responsibility for the marketing of a very competitive and technologically advanced range of micro-computer based systems and intelligent terminals through a network of European distributors. The job is UK based and will be substantially devoted to direct selling activity, but enhancement of the sales operation is envisaged as revenues expand.

We are seeking accomplished sales people with at least three years' experience of selling computer hardware at the OEM, distributor or end user level. All applicants must clearly demonstrate an ability to negotiate at the highest possible level within a variety of international situations. Existing experience of selling within Europe and the ability to speak French and/or German will be advantageous but not essential.

On target earnings will be in the order of

£20,000 + Company Car

Please submit complete career details to Alan Williams quoting reference CAN/103.

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FIELD SUPPORT/SERVICE

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One of the great American innovators in the computer industry are launching a major new product range. Support positions are open to engineers with IBM experience seeking real challenges and development opportunities.

FIELD SYSTEMS ENGINEERS - LONDON/HOME COUNTIES
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Fast growth mini manufacturers - two new branch offices within the next 12 months - seeks promising young engineers - train U.S. for Europe - next more technical support.

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Computer manufacturers offering opportunities for career development to field service engineers, full product training covering all points, dynamic management team and early promotion. Good walls to arrange early interviews with any of the above managers - 4444 (8 lines), also many others.

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DIRECT LINE
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D.P. Professionals

We manufacture and market all these well-known brands. Right now we need the following D.P. Professionals for our IBM 4331 and System 38 installation:

Operations Supervisor c. £8,500

You will be an experienced Supervisor with a strong DOS/VSE (E) background in an On-line environment. If you have worked with remote communications this would be an advantage.

Senior Programmer c. £8,500

We are looking for PL/I/Shadow II experience for our IBM 4331 with the opportunity to work on the System 38 later. All necessary training will be given.

Analyst/Programmer c. £8,000

Some systems analysis experience is required with a relevant programming background.

For further details please contact Mrs. Sharon Millen, Personnel Department,

CPC (United Kingdom) Limited,
Claygate House, Esher, Surrey.

Telephone: Esher 82161.



It couldn't happen in DP - could it?

OUR administrative office decided it needed a new photocopier - nothing fancy, you understand, just a desk-top job that could handle plain paper...

We had seen several Press advertisements telling us how many different companies had the best photocopier in the world, and decided to call a few of them to see what they had to offer.

However, being a sales orientated organisation, with strong altruistic feelings towards salesmen, we decided to make it easy for them, stating the type of copier we wanted, the number of copies we were likely to need within a given period, the type of printing method we preferred, the sort of money we were prepared to pay, where we were located, etc.

"Hang on a minute," we said, "you're forgetting your machine."

"Oh yes," he said, "will it pick it up later?"

That seemed reasonable, bearing in mind the struggle he had in getting it into the office in the first place. But just as a precaution we asked when he could collect it.

"I am not sure," he said, "I'll let you know," and despatched our protestations, left.

A week later, by which time we thought he had forgotten it, he phoned to say he would have to leave it for a further fortnight. You see, he was going to America on a free holiday paid for by his company - because he was their top salesman.

Meanwhile, back with the other photocopier manufacturers, and some three weeks later, we have seen only two other salesmen from the six companies we contacted.

And the market leader has still not got round to acknowledging our letter and phone call.

I only tell this true story for academic interest. I mean to say, this sort of thing could never happen in the computer industry, could it?

Alan Williams

COURSES

■ SENIOR executives with little or no practical computer experience may benefit from a series of five-day residential courses, organised by Counting House Computer Systems, in association with the European Management Advisory Service Group. Each course, to be held at Counting House's training school in Bury St Edmunds, will demonstrate how the use of computing techniques can improve effective business management. Courses will be held in June, September and December. Fee, including board, is £450 + VAT. Delegates from Hugh Holland, Counting House Computer Systems, Farnham House, Farnham St Martin, Bury St Edmunds, Suffolk. Tel: (0284) 68921.

For details on these and other spring courses, telephone Hilary Colyer at Control Data House on 01-240 3400.

PUZZLE ANSWER

A SPEEDY mental solution can be arrived at by searching for a square of the form $n + 19$ (where n is my son's age now). Only 35 fits the bill so $n = 17$, and it seems the likely answer to "several years", to give a cube of 8 at that time. Further brainwork soon brings forth 45 as my age, to produce the cube $45 + 19 = 64$, and the square $45 \times 9 = 36$.

Complete the coupon and return to Effectia Gravis, National House, 66 Wardour Street, London W1V 3HP, for your next PERMANENT or CONTRACT job.
(BLOCK CAPITALS PLEASE)

Name (in full).....

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Experience to date: (Last Position First).....

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Data..... Signature.....

Reg. No.

DATE.....

CW 19/3/81

CONTRACTS

WEST OF LONDON Technical Data Base Designer for IBM environment. Immediate start.

WEST COUNTRY Programmers - Hewlett Packard, 3000 COBOL Image Query Experience.

WEST OF LONDON IBM COBOL DOS experience. April/May start date.

Please telephone John, Paul, James, on AMERSHAM (020403) 22201

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